COMPUTERWORLD

INSIDE

Hardware Roundup: Trends and products in large, mediumscale and specialpurpose systems. Page 71.

In Depth - Slaving data center dragons through outsourcing. Page 89.



When Avon ralls, the sys tems better be up and running, or Raymond Perry wants to know about it. Page 61.

Geneen's group wins endorsement in Continen-tal Information Systems bid,

but Finalco is ready to battle the offer in court. Page 6. Risk and reward mark Merrill Lynch's decision to sign up as the first custom-

er for IBM and MCI net management services. Page 120. DG catches the wave, us-

ing HP windows system as front end for minicomputer office package. Page 16. Wall Street firms have

crimped their data centers and contracted for cut-rate telecom services Now they're eyeing the cost Miniscribe scandal plays

out, with internal probe report claiming fraud by former management. Page 95.

Get out the aspirin as PC

virus season nears. Page 39.

MYCE RROWN UNIU MICROFILMS INTERNATI.

Cullinet era ends; workers await CA's ax BY STANLEY GIBSON

WESTWOOD, Mass. - The fi-

WESTWOOD, MASS. — The tr-nal Cullinet Software, Inc. stock-holders' meeting lasted all of seven minutes. When it was over, Cullinet ceased to exist. The meeting's only order of business was to count the votes on the

proposed acquisition by Computer Associates International, Inc. The result was nearly unani-mous approval: With 76% of the shares voting, more than 25 million voted in favor, and only 184,000 voted

when the takeover was com-pleted Tuesday, John Cullinane

uttered the words, "Thank you weeks of uncertainty for employevery much for coming, and good luck," thus ending a chapter in
the history of the software industry and marking the beginning of
who lingered after the meeting

Cullinet Software, 1968-1989

•1968 Founded +1973 IDMS intro • 1978 Perstpublic stock offering # 1982 First software company fisted on NYSE

• 1983 Introduced IDMS/B • 1985 First dip in profits after 19 que •1986 Money-losing quarter in July

• 1987 Founder John Collinane retires in Sect +1988 Cullisane comes out of retirement in March *1989 Computer Associates bids in June; deal closed Sept. 11.

nt and support all have a Continued on page 120 Lightweight

laptops make

Supercomputer users caught in eye of political typhoon

Old boss

BY JAMES DALY

go a long way. Just ask MIT go a long way. Just ask MIT.
Deep into bargaining with Fujitsu Ltd. and NEC Corp. over a
supercompater purchase. MIT
was curtly notified by the U.S.
Department of Commerce that
any special deal the Japanese
firms may cut could be subject to
antidumping proceedings. The
agency also reminded the school
of all the federal grant money is
receives — and would probably
receives—and would probably like to continue receiving. Faced with an offer it could



not refuse, MIT showed a Cray Research, Inc. Cray-2 into place this mainmer. "It became clear that important elements of the federal government would prefer to see us acquire a supercom-puter based on U.S. technol-ogy." MIT Provost John Deutch

The situation has become so bad, as MIT learned, that the resources of some of the most pow-erful machines in the world may be effectively off-limits to U.S.

trickling into areas as di car assembly and we rediction — some are begin-ng to wonder whether the U.S. Continued on page 121 hefty boasts BY JAMES DALY and RICHARD PASTORE SUNNYVALE. Calif. - The in

reached a new level or diminu-tiveness last week with the debut of two MS-DOS portable computers, each weighing in at about one pound and protein-ing extended operating time powered by standard AA-size

hatteries.
Atari Corp. and start-up
Popet Computer Corp. both laid
claim to the featherweight title
by introducing handheld computers that are roughly the size of a
videocassette and use less power
than a twinkling Christmae-troe

Guerrilla tactics drive LAN advance

BY CHARLES VON SIMSON managers attending Network

rganizational weapons they are used to fight the political perrilla wars for control over orporate standards and prolif-DALLAS — After they glanced at the gizmos in vendors' booths, the true business at hand for the

ation of local-area networks. Typical of the stories told was e recent installation of thouands of personal computers at danufacturers Hanover Corp., ore none of the users were

The absence of a disk was not an oversight; it was a response from Manufacturers Hanover in-

their updated database informa-tion on network servers. In-stead, they were using their own disks, resulting in a large lag in the integrity of corporate data-

bases.
"We were constantly telling them to store information each night on network servers," said Stephen Morse, senior technical analyst at the New York bank. "They typically tried to do it about one minute after their system crashed. The only response we could offer was to come around with a handleerchief and

IN THIS ISSUE

MEWS

ek's new product

Intel's 1960 offe

stashing IS ra on Wall Street 10 Xvvi

Xyvision hopes to y its Parlance software mainstream product. 12 Delays in next Unix

16 Window dressing: Data General's CEO package get 120 Merrill Lynch take the bull by the horns and

entrusts corporatewide network to IBM and MCI 120 CA soothes Culti ners' nerves by pointi

computer plan might be than its budget

Quotable

W e were con-stantly telling

[users] to store information each night on setwork servers. They typically tried to ute after their system

> STEVEN MORSE MANUFACTURERS BANGVER

SYSTEMS &

23 SQL/DS is left a wallflower as the third-part tool yendors cut in on DB2. 25 Now-obsolete, IBM plug-compatibles — the Stanley Steamers of

computers — go quietly into the night. PC: & WORKSTATIONS

39 Microbes for micros: Several virus strains are ex-pected to appear this fall.

NETWORKING 51 No user is an is-LAN-d: Interconnectivity is the buzz word at Networld '89.

UPDATE ig fish, shrinking pond. The big fish is Computer Associates, and the pond is the mainframe software business. A year ago last week, CA announced plans to swallow a key competitor. Last week, gallows humor about layoffs prevailed as employees of one-time industry star Cullinet watched the sale of their company and its identity become just a page in CA's an-nual report. But the haunting part of the industry change is that the acquisition plans that CA made just a year ago had nothing to do with Cullinet. At that time, CA was buying Applied Data Research, which is now just another name from another time.

MANAGER'S JOURNAL

61 Indulge your pet projects with funds from a secret IS pocket.

COMPUTER INDUSTRY

reaches truly epic pro portions with report

HARDWARE POUNDUP

71 Large systems hit into the wind, while medium-scale machines adjust their bearings and special-purpose systems shake out after a

IN DEPTH

89 For many organiza tions, outsourcing may be the most cost-effective way to manage a data center. By Allen G. Hammersmith.

DEPARTMENTS

- 8 News Shorts 20 Editorial 68 Calendar
- 64 Book Reviews 102 Computer Careers
- 112 Marketplace 117 Training
- 110 Stocks
- 122 Trends



de TI no # 21 at tu

EXECUTIVE BRIEFING

- An essentially "free" upgrade to an intelligent, multivendor system the stuff IS dreams are made of - is the potential payback for becoming the first customer of network management services jointly pro-vided by IBM and MCI Communications. The customer is Merrill Lynch, which recently negotiated a five-year contract under which MCI and IBM will develop a tailored system to centrally manage Merrill Lynch's network. The contract will cost \$50 million, but that's how much the investment firm would have paid to manage its own network without an upgrade. Page 120.
- The ink was barely dry on the final entries in Cullinet Software's books when new owner Computer Associates launched the layoff and consolidation process. As part of this consolidation, CA said that Cullinet's IDMS/R database management system will be integrated with other CA products under CA's Applications Construction Environment and will be enhanced with SQL support. Pages 1 and 120. B Some bold strokes were executed in the large-system market this year, but on the whole, innovation was handicapped by an industrywide slowdown in demand, according to Computersworld's amount Hardware Roundup. In spite of their failing profits and largely many convention.

managed to update the product lines. Those wi took the boldest steps can from outside the IBM marke IBM and plug-compatit

ogy overtook the med scale systems market, and even DEC couldn't fight it off

pays for data from commer-cial suppliers. Some Wall Street firms are trying to economiae by checking out al-ternative sources for digitized data and by making sure that

what they buy gets distrited in the most efficient morr. Page 8.

ucts and mark

hours of tough work. Page 102.

■ Users want more from IBM's SQL/DS DBMS. They want more performance, and they want more utilities to help them menage that DBMS. Page 23.

A high-tech slush fund ay be the way for IS man may be the way for IS managers to experiment with lead-ing-edge technologies with-out having to cost-justify the expenses for top manage-ment. It sounds manufacturers meintained the status que, but such con-panies as Unisys, Bull and DEC introduced new genera-tions of high-end machines. Fage 71. Meanwhile, the call for RISC-based technolexpenses for top manage-ment. It sounds saeaky, but according to one consultant, hiding such investments with-in the IS budget may be nec-estary. Page 61.

At New York's U.S. Trust Co., an optical discbased system is seen as o way to alleviate paper pand monium. Page 39. One way to save money in the IS budget is to look at

■ IS managers can to their technical profession to fill several education structor, tutor and mentor or touch. Making such a pro-gram work calls for support from top management, training for the professionals with

clade which party is respon-ble for specific types of failu-and which one may mal copies and distribute ther

DATACOM/DB

The Best Database Now Comes With A Couple Of Extras.

CA-DATACOM/DB is now supported by the technological and financial strengths of Company and Strengths of

With its unique conduction of the BUSINS Excitates and the second of the BUSINS SECOND Second

story for the

V seepen below.

AOMPUTER ASSOCIATES

Wang cushions its line of minis

BY MARYFRAN JOHNSON

LOWELL, Mass. — Wang Lab-oratories, Inc. fleehed out its proprietary VS line of minicom-puters hast week with new ma-chines, extended capacity de-vices and a workstation designed

hers of workstassion on-pherala.

The first ECP product is an enhanced release of the VS/Vir-tual Machine software, allowing up to 16 multiple operating sys-tems to run concurrently on a single system. The second prod-uct connects up to four VS/VMs to allow data file and printer sharing. A third is an I/O expan-



ong boofs up its mini line with VS8000

sion cabinet that provides up to 15 extra slots for L/O coprocesof the VS8000 line and future duct plans. "We believe this system will usly be attractive to our in-

sors.
With the workstation market
in mind, Wang offered its
VS4550 "diskless" machine,
based on an Intel Corp. 80286

manager made it clear that if the next release of OS/2 takes up even more memory, he will start to become concerned, possibly

"It's one thing to have these tures and functions available

based on an Intel Corp. 80286 microprocessor and priced at \$1,995. It is the first Wang workstation to allow a user to ac-cess and concurrently run MS-DOS and VS applications. The financially shaken Wang, now in the midst of massive lay-offs and creditor wees, put forth

stailed base and to new custom-ers as well," said Ian Adam, ng's director of worldwide

wang a director of worldwide product marketing. Chris Christiansen, director of midrange strategies at Meta Group, Inc. in Westport, Conn., saw it a bit differently: "This is a good solution for Wang's ingood soution for wang a in-stalled base, but they're not go-ing to attract substantial num-

Also attractive is the ability to

haunch a DOS application from a Presentation Manager shell.
"Previously you had to go into the compatibility box and select

what you wanted to run. Now, I can deliver an OS/2 desktop to a user where they can launch a program from an icon without knowing whether it's DOS or OS/2," the IS manager said. "It

Unix still in the scene?

Christianses particularly crit-icized the VS8000's lack of a

icized the VS8000°s lack of a new operating system, surjent that the ECF products were "cobbled topether" to make up for the lack of greater task upport that a more advanced operating system coald provide.

Company officials responded that a new operating system would be out "in a few months" to replace the VS Version 7.30

perating system now used for oth VS7000 and VS8000 ma-

both VS/U00 and VS8U00 ma-chines.
The VS8200 and VS8400 se-ries are intended for customers harge volume data process-ing and office automation needs. The VS8200 can support up to

VS8400 takes up to 900 work-stations and peripherals. A VS8200 with 4M bytes of memory and an annual VS ii-cense costs \$80,000, while a VS8430 with 8M bytes of mem-ory and an annual VS license costs \$204,000.

costs \$204,000.

For Columbia Sportswear Co.

in Portland, Ore., the VS8200
has been a blessing during its few
weeks in residence at the sportswear manufacturer and whole-

"We're using it in basically all aspects of our operation," said Shari Jacobson, the company's

makes it easier for them to use."

HPFS offers several purported improvements over the File Allocation Table, or FAT file system of MS-DOS, basically by DOS applications running in OS/2'a DOS-compatibility box. He estimated that the addition of 40K bytes of random-access memory will let him run another 10% to 20% of his current stable system of MS-DOS, basically by re-engineering the way data is laid out on the directory and in files on the hard drive. It sup-ports installable file systems, making it possible to access mul-tiple incompatible volume struc-tures — FAT, HPPS, compact of DOS applications. He cited Borland International's Paradox and Lotus Development Corp.'s 1-2-3 as examples of applications that "just didn't run" before.

tures — FAT, HPFS, compact disk/read-only memory and pos-noby Unix — on the same OS/2 system, according to the Sep-tember issue of the Microsoft Systems fournal. Existing applications will have to be modified to take ad-vantage of HPFS, so it is not clear how soon users can expect to see the second systems.

clear how soon users can expect to resp the advantages of it.

Polished OS/2 upgrade a memory muncher

BY PATRICIA KEEPE

aster performance, higger files at greater support for memo-intensive MS-DOS applica-ons are the drawing cards held r Release 1.2 of OS/2 Standard dition. On the downside, these enough to slow do gration to OS/2. leatures and functions available to me, but I have to look at what it's going to cost me," he said, pointing out that a 22M-byte to set currently costs \$1,395. The IS manager said he was enthusiastic that Microsoft in creased memory available to

en highlighting an im-DOS-compatibility box, a nes neen highlighting an improved DOS-competibility has, a high-performance file system GIPFS, a modified graphical user interface and a system editor for IBM and Microsoft SSP Presentation Manager.

"As a lot better than under "As a lot better than under work of the system of the

as desarrop standard.

However, the IS manager
said he would have fiked even
better performance improvement and "expected Release 1.2
to take up less memory than

Although he said he can live ith the shortcomings of 1.2 — hich is due for general release is month from IBM — the IS

While OS/2 remains positioned as the clear suc-cessor to MS-DOS on the desktop, Microsoft made it equally clear last week that it is not cut-

mode it equally clear has week that it is not cut-ting Union out of the picture. Beautiful plans out of the picture. In hardings has week to Richtred to not con-stantive Edition. Microsoft: professed as in-stantive Edition. Microsoft: approximate beautiful plans of the picture of the pic

It will invest in technology to port Presenta-tion Manager to Unix. The port will be called PM/X.

• LAN Manager/X (LM/X), which is selto be shipped possibly this month by developer Hewlett-Packard Co., will provide Microsoft's answer to Novell, Inc.'s Portable Netware. OEMs will be able to port LM/X to their propri-

Some confusion may be created by AT&T, which is developing its own Unix port of LAN Manager, slated for delivery in the first quarter, according to a source.

PATRICIA KEEFE

COMPLITERWORLD



THIS GIVES YOU A ROUGH IDEA OF HOW FAST OUR SOFTWARE IS.

It's only a rough idea, granted.

But then, how do we convey the speed of our products? Software that can dramatically reduce the use of your computer resources: CPU Time, SIOs and the like. Typically, by as much as 50%. Frequently, even more.

And that not only goes for our sorts, but for all our products.

But there's really only one way to get more than a rough idea of how fast our software is: try it yourself. To arrange for a test on your system, call 201-930-8200.

We'll whoosh right over.



HP image yet to play in Peoria

SAN FRANCISCO — Nearly 4,000 Hewlett-Packard Co. us-ers flocked to the 15th named in-terex conference last week for firsthand view of the gitty new image HP has been cultivating in

key Interex HP conference

the last year.
With giant video screens and rock-and-voil music undersconing HF's rocate aggressive sature, some users were wordering when the transformation would become evident in their "I'can't find a single person at HP who is interested [in] selling on the same level as IBM," commented Robert Meissner, director of information systems at Welding Engineers, Jos. in Blue Bed., Ps. He said that IBM could their feet with a sales persentation.

In addition to image identifi-tion, users said that it is still

nical or commercial ," said Bob Greno-

hierarchy and the processing units" has fallen behind, conced-ed Joel Birnbaum, vice-president and general manager of the com-pany's Information Architecture Group. Birnbuam said the com-

RISC pays off

14% (Sperc) (Power 6/32) 6%

Mini upgrade, other rollouts

Aiming at the daisywheel and dot matrix printer market, HP now offers a Laserjet printer for \$1,495. The Model IIP claims a 4-page/min. output at 300 dots per inch.

The Model 960 is a board upgrade from the 955. Additionally, the congraty reduced the top, the congraty reduced the top of the product of the 15255,000. The Model 960 is 4485,000. Other host of the conjunction of the conjunction of the 1525 of th The printer, which analysts expect to be the preferred desk-top design in the near future, has 14 typefaces available. It also has cartridges for accessing

Open Software Foundation for blessing as a Unix standard tool, said Sussa Cook, product mar-teting manager. The company's first product was customized for HP's proprietary operating sys-tem, MPE.

prietary operating system re-lease, Version 2.0, expected ear-ly next year. These functions include the following: works.

latest technology, appears more interested in HP's old machines. For instance, ther were fears that the 23-year-ol Model 1000, a family of technic

model 1000, a name or technical
manufacturing computers with
the proprietary RTE operating
system, would be a dead end
elesyste some soft assurances from
Willem Roelandts, vice-president and general manager of the
company's Computer Systems
Group, that new products are
under discussion.

under discussion.
"I don't think users believe they will have new 1000s," Gre-

noble said.

Another area in which users were highly critical of HP was its maintenance support. Due user complained the company gets seither his making address nor the terms of his contract correct. This comes one year after a much-ballyhood multivendor emport division was setablished

interlanguage. For the HP 3000 Series 900 computers, several functions will be added with the next pro-

An LU6:2 application pro-gramming interface to allow communication between IBM mainframes and HP 3000s on a

With its early commitment to RISC, HP has been the greatest beneficiary of system sales using the neuer technology

Other 2%

More jazz

reduces computing (Ra-computing HP. They will feature the higher per-formance of the RISC ar-chitecture and are expect-ed to be in the \$5,000

ed to be in the \$5,000 prior range.
"The sare there's a certain amount of genesementals involved, like, 'OK, Son match this," and Andrew Allison, coltrar of the drew Allison, coltrar of the vice before spending \$10,000 on an IBM Personal Systems(2 or immittee conspiculty of the control of \$000 on phications, he added.

A SAMAGE.

Former ITT exec gets nod from CIS

BY NELL MARGOLIS

At 15 million instructions per second (MIPS), the HP 3000 Model 960 claims a maximum user base of 600. This is up from the Model 955 earlier this year which claimed more than 400 users and 11 MIPS. The model features mirro-faik operation, the first product in the line to do so.

SYRACUSE, N.Y.— Bidding to buy sidelined computer-leasing player Continental Information Systems Corp. (CIS) out of bankptcy entered the homestrete t week when the firm's box

last week when the firm's board of directors accepted a \$400 mile. In offer from former ITT Casimums Harded S, Genoent.

CIS' creditors have yet to bleas the deal, which must be approved by the bankrupter court, and questions raised by rival baided F Fisalco Corp. Indicate that the race is still very much on. The \$40 by CIS Acquisition Corp. (CAC), a \$1.71-asseed comp.

by CAC's finiture to raise funds to support its otherwise-winning \$18 million bid for CIS' Canadian subsidiary earlier in the CIS Chapter 11 proceeding. "I don't think this deal is going to go through," Donoran said. Qualims about management as well as money could color the prospects for CAC, said Harold Van Armen, charman of Finaico, a Bocs Raton, Fin.-based com-puter lessor.

million in bonds.

Under the terms of the CAC proposal, the company will remain "mibstantially intact, in Syracuse and at other locations," Brooks said. The proposal contemplates "no substantial reductions in work force." "We've been told by the credtors' committee that we're the preferred bidder, mainly be-cause of our extensive experi-ence in the computer leasing

business." Van Armen said. "We not only have financing but have put together a 125-person saises force that is waiting and ready to party hat himself." Financia purt yet a timeler. The purt yet at himself. The purt yet to the said of the purt yet of the financial purt yet to the financial purt yet to financial purt yet to financial purt yet to financial the financial the financial the financial purt yet to financial financ

with regard to current CIS mun-agement have been made, Brooks said. If "substantially in-tact" extends to CIS manage-ment, Van Arnem said, then "what' aon the table right now is the same group that has put the company in the mess it is in right now." Neither Geneen nor CIS Chairman and Chief Executive Officer Harry Goetzman, I. was vaulable for comment.

The final word, all agree, will use from the croditors and the deral bankruptcy judge. Under plant has up to 60 days — some-mes longer — to solicit opin-nis and hear discussion." broughout that period, the law rovides, the offer in question is abject to higher and better of-

LAN advance CONTINUED FROM PAGE 1

cry with them." Users now have no choice, Morse explained, and a network manager ensures that data is carefully

manager ensures that data is carefully stowed daily on a server.

The most significant tactical shift was based on the near-consensus that hard-number financial justification was not the best way to justify networks to senior

best way to justify networks to sensor management.

"Management does not believe that you can cost-justify a LAN," said Bob Moscowitz, network technology support specialist at Chrysler Corp. "If you do, you are viewed suspiciously; people assume your numbers are cooked."

The best way Instead, several managers agreed the best strategy is to compile a comprehensive first of users who have embraced the technology and one that policial monetum in may pitch to senior people. However, "gesting user coalitions together can be dangerous," said Eldon Moreland, network analyst at the Gas Clearing House Co., a Houston natural gas broker.

pas broker.

"To keep them behind you, everyone has to get their piece of the action; that can mean you wind only with a political rather than a functional LAN," Moreland said. Moreland said. Moreland said. Moreland said. Moreland said with a server, which was purchased because of the support of these constituencies. When the machine arrived, the users partitioned the hard disk three ways and denied access to each other, "Initially, it denied the hard while purpose." Moreland desired the whole purpose." Moreland

to.

The growing complexity of networks also pushing users into much tighter retionships with network vendors, such as ovelli inc. and 3Com Coro.

Deming-inspired
"We are a food company, and we do not
want to get into the computer business,"
said Chuck Clabots, group leader of the
network technology group at Pilisbury
Co. "That has led to a Deming-inspired

relationship with Novell as our principal supplier."
Clabots was referring to W. Edwards Deming, whose pioneer work on industrial quality advocated dose relationships with a few suppliers that could work in a partnership with a company. First Bank System, a mid-western bank holding company based in Minnegolin has a uniline relationship with Bonyan

s a similar reasonal, inc.

"The ability to keep a single operating stem and work as closely as we do, on a ceekly basis, with Banyan support has simplified our development pro-

alyst.

Although close vendor relations have solved some technical problems for Devries, the organizational conflict surrounding ownership and billing for LAN use still rages at First Bank System, as it does at

most companies.
"We are in the process of proposing that the information center take control over LANs," Devrice said. "But because of advanced protocols like LU6.2, it is impossible to draw a line where communications end and applications begin. We are still fighting over location of workstation and servers; I am not certain how it will

Intel unveils multitasking chip

SAN FRANCISCO - Intel Corp. conti

ued a busy year of microprocessor intro-ductions last week with the rollout of a chip that can juggle as many as three tasks at once.

While multitasking is common in many areas of computing, the 32-bit 1960 uses a technique called superacalar parallel processing to become the first commercially available chip to fetch, decode and begin executing several instructions simulta-

nal chips typically process

"But we knew that simply increasing clock speeds to execute serial events fast-er would translate into core-prohibitive memories and peripheral components," and Ken Fine, general manager at the Santa Clara, Calif.-based company Chandler Microcomputer/ASC Division.

With the added speed, the 1960 can move the contract of the contract

If you are presently using these systems, let IAM reduce your Nightly Processing Time 50% to 80%

McCormack & Dodge IAN



NEWS SHORTS

Touche Ross, Unisys pair up Accounting and constiting firm Touche Ross & Co. and Unisys Corp, senouscod as alliance last vent under which they will provide large scale systems integration. One of the two firms will be identified as the prime contractor for each major inte-gration project, based on the skills needed.

Unitys offers new disks
Unitys also moved but week to boost on-line storage capacit
for all of its mainframe lines by releasing new disk subsystems.
The IG-byte M8720 subsystem will be effered for the Unity
1100/90 and 2200 series of mainframes, and the M9710 is of
signoif for the A and Vereine of disniframes.

an named CIO at Covia

I CHING Rearross LPG at LOVES Covis Cop. created a chief information officer position is week and awarded it to Mark Tellian, formerly vice-preside of technical planning and systems engineering at the join held sirline information systems subadiary. The appointme is primarily a title change, given that Tellian will essentially than his former job a responsibilities.

ACM warns of decline in R&D

The president of the Association for Computing Machinery last work wrote a letter to President Bush commending him on his call for international participation in the space program. However, Bryan Kocher also warned Bush that a decline in not ware engineering and computer acience research and development may import the U.S. shifty to carry out the ambitious goals of

Price cut for NEC Ultralite

The fittle laptop with the lap prior tay, NEC Home Electronics, Inc.'s Ultraite, dropped in price last week as NEC cut the price of the 28th-byte model from 3.2,999 to \$2,999 and the 1M-byte model from 3.2,999 to \$2,499. NEC, which plans to make a laptop announcement today, and rate had exceeded expectations and that economies of scale make the reductions possible.

Novell hits lower mark

As expected, Novel, Inc., but week amounced third-quarter revenue growth slightly below has year's figures. While total revenue was up 13% over last year, earnings sid about 2.5%. The company clied memoraturing charges associated with the acquisition of Excelan, Inc. as significant factor.

Vendors back RPC offering

Sun Microsystems, Inc., Netwise, Inc. and Novell, Inc. round-ed up 18 vendors and one user last week in an effort to get the development community standardised on a remote procedure call (RPC) based on the three firms' technology. RPCs shield s heterogeneous pistforms without modification. Di ment Corp. and Hewlett-Packard Co.'s Apolio Div

IBAN burys stake in Index Continuing in acquisition spree in the computer-aided acti-ware engineering (CASD field, IBM last work agreed to bury a minority equity interest in CASS vendor Index. Technology Corp. IBM will pay \$2.5 million for a 5% interest in Index.

Judge OKs Leading Edge proposal A basinquier ouer last week approved a reorganization ple for Leating Edge Products, inc., which had been operating a der Chapter 11 protection since which had been operating as der Chapter 11 protection since Portury. The plan, funded by Darwoo Telecom, lac., provides for payment of 400 creditor primarily with Leading Edge products.

Securities firms eye data costs

BY DAVID A. LUDLUM

Information systems managers under the gun to cut costs are training their sights on a new target — the digitized data their companies buy from commercial suppliers, often for tens of mil-ions of dollars a year. Securities and inve

firms — major buyers of data that are struggling with shrin that are struggling with shrink-ing profits — are among the leaders of the campaign. At least two major Wall Street firms are contemplating a two-fronted as-sault — scaling back outlays to vendors and streamlining distri-

bution of data once it is bought.

At Merrill Lynch & Co.,

"1990 will be the year of market
data," said Bruce Turkstra, the company's senior vice-president of global information services. That emphasis follows this year's focus on telecommunica-tions and last year's push for data center consolidation, Turk-stra told vendors at the annual conference of the Information

Industry Association in New In the past, Merrill Lynch

miness units that used data ac-aired it on their own; now the meany wants to standardize



buying data from 66 suppliers, wants to consolidate purchases among fewer vendors and inte-grate ordering, installation and billing. Turkstra said. Such efforts are driven in part by the helty profit margins reaped by data vendors, said

systems executive at Goldman, systems executive at Goldman, Sachs & Co. Businesses enjoy declining costs for purchases of many products and services such

as telecommunications, the prices for some financial market data are going up. Adam said.

Goldman Sachs spends tens of millions of dollars a year on elec-

tectional address speece (see a constitution of the tection information and its traperlying that outlay as its priority in reducing costs. Adams added. "As prices stay high, then you look at trying to find alternate sources, you look at make vs. do not not seen to be a constitution of the seen and the s

all market data in the zerm, the actes and.

Adam suggested using electronic data interchange among the 200 companies with which it shares information, mostly through point-to-point connections. More methodical communications would promote standard and inspection of the control of the contr

Laptops FROM PAGE 1

devices so far.

Attri wrapped itself in the low-price mantle of \$399 for a 128k byte randown-access memory base model expandable to 6400. Nytes; immediate shapments have begus, the firm said. Although there are few such machines available now, "You're going to ace as low now," predicted Kinhoull Brown, an analyst at Prudential-Back. Securities, Inc. in New York. "There is a really used market for these meals used market for the meals are market for the really good market for these ma-chines." Users are not satisfied with just data collectors or units capable only of munipulating files downloaded from full-function

downloaded from full-function machines, Brown and.

The Popet uses a mere 50 millimatts of power. The secret is that the machine has no mov-ing parts. Rotating magnetic drives have been replaced by the solid-state integrated circuit memory cards. Although the power from two batteries shuts off between keystrokes — providing an operational life of up to 100 hours — the portable offers an access time of 100 nsec. At

the heart of the machine is a 7-MHz Intel Corp. 80C88 chip. "It sets a new standard for IBM-compatible computing.
There's nothing quite like it on
the market," said Bill Lempesis. the market," said Bill Lempesis, an analyst at San Jose, Calif-based Dataquest, inc. Lempesis said the only thing that may in-biblt early sales of the Poqet PC is its relatively high price. Entry-level laptops can be had for an lit-

tle as \$600.

Both companies offer standard QWERTY keyboards; Po-qet a system provides 77 keys, and Atar's offers 63.

Atar's Portfolio, which also powers off between keystrokes, is powered by three AA-size bar-teries that have a continuou-use life of 48 hours, the company-mid.

The Atari machine runs an perating system "adapted" com DOS 2.11 and uses a 4.9-MHz 80C85 microprocessor. Its screen only provides a 40-col-

umn, eight-line LCD, but its win-dow function en-ables users to access any portion of a virtual 80-column, 25-line display. Poqet, on the other hand, trotted out an 80 eracter by 25-

line display with resolution of 640 Poget's secret is no moving parts

me onings with properties of the properties of t

Atari said it will provide optional storage on cards offering 32K, 64K or 128K bytes of memory. Although Poget has not built many systems to date, it has be plans. Marketing director Gerry Purdy said the 19-month-old company hopes to sell 300,000 machines eart year.

company appet to see 300,000 machines near year.

Popet's odds of success are increased by the financial backing of Fujitsu Ltd., which owns 38% of the company. Additionally, Fujitsu is working on a Japanese-language version of the product and can ensure a steady



component supply in the event of a RAM chip shortage, Poget President Stan Prodromou said. Early evaluators Early evaluators seemed ready for the Popet PC. One po-tential customer is Amdahl Corp.
— in which Popet backer Fujitsu has a 49% share — which is considering arming its national sales force with the portable. "We have inptops now, but they're ofhave isptope now, but they re or-ten so cumbersome that they are frequently left behind," said Lin-da Fadden, manager of market-ing systems. "We're looking for true portability, and Poqet may have something here."

Find Out Why ORACLE Is Ranked The Number One DBMS. Attend A Free Data Management Conference In Your Area. control states control to Learn about the fully relational DBMS than's "compliant with ANSI, IBM SQL.

 Explore the productivity of 4GL & DSS tools. See portable applications run across micros, minis & mainfrances

· Integrate PCs & MACs with MIS. · See the latest distributed financial applications.

Your purchasing timeframe (check one):

.

ed committee of them status

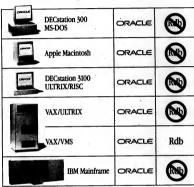
. Learn how CASE can end your application backlog.



20 DAVIS DRIVE BELMONT CA 94002

has it now...

With Rdb, Digital has it only on VMS.



RACLE® database technology fully supports Digital's hardware strategy. Rdb doesn't. Digital is embracing several different architectures within their multi-vendor networked environment. Unfortunately, Rdb is only available on VAXs running VMS

Only Oracle offers hardware independence across virtually every mainframe, minicomputer, workstation and PC. Nobody else can. Nobody else is even trying.

That's why Oracle Corporation is the world's largest database company, and why Oracle is the largest independent supplier to the Digital marketolace.

If Digital's multi-architecture strategy makes sense, then Rdb doesn't. We invite you to learn about ORACLE. Register today for the next free data management conference nearest you.

APPERION	ı
Aug S	l
Sept Y	l
Sept 144	l
Aug 13	ł
n Beach Aug 10s Sopt 28/	l
remo	١
ncisco Aug 24 Sept 28 Jura Aug 13/8 Sept 28am	ı
to Springs Aug 24 / Aug 24g Aug 21gb Sept In	l
d Sept 12m	l
seille	١
Sept 21/	ı
Sept 134	1
Sept 140	١
Sape 14g Sape 20g	ł
rac Sapt 14 anolis Aug 296	l
Aug 15	1
Bouge Ang 24m riesen Sept 200	ı
groon Ang Vig	Į
nghans Sept TV oes Sept Sip	ı
Ang San	ı
Ang Say apoliti. Ang Say Saya 12/a a City. Ang 1/a Saya 10a ata Ang 8/an Saya 12ay	1
Sept 6	ı
denot Sept 12m	ı
ryt Sept 14/	ı
he Ang His Sept 20/ he's City Ang Sf Ang 230	ı
Sept 13/ Sept 274	ł
read Aug 17m	١
abos Aug 15/ Sept 14	1
The second secon	y
See 1 and 1	
dung Aug 15 of Process Aug 15 desphis Sept 5g Sept 25 sumph Sept 26 phis Sept 10 ridle Aug 17	١
tile Sept the	ì
elle Aug (1) lept 2/ght lept 2/ght lept 2/ght lept 3/ght Sept 2/ght lept 3/ght Sept 2/ght	ä
seesio Sept 28/04	ı
nond Sept 21	ı
see Sept 30	į
pulse Sept 12	1
In the property of the comment of th	ŧ
Penacida Applicacion Trois	
The state of the s	





Xyvision makes the 'open' shift

have been for a couple of years," Waiter added. "They had to give in to market pressure. They're the last holdout."

The new release of Xyviss software, Integrated Publishi System (IPS) 3.0, will run Decstation 2100 and 31 workstations and on Decsyste 5400 and 5800 servers, as was on Xyvision's own brand

workstations and servers.

IPS 3.0 is available immediately, but it will be next spring before the entire Parlance system is ready to ship, a company

This Software Can Organize Your Files, No Matter What Shape They're In.



No matter hav you store your important door, ment, MM Dochman and the control of the Because unlike some antenned filling potents. DMS Because unlike some antenned filling potents. DMS and the control of the control of the control of well sorts and of the control of the control of well sorts and the control of the control of medium to another. So you can plan for changes in medium to another. So you can plan for changes in Another maps of position of MMD DMS in the air makes efficient use of computer system resources. If so the this planting all related controls to a

Master Record, which allows you to access files fast. DMS is also easy to install and implement. And simple to learn and use, because 3M tailors the software to your individual application.

3M has already installed DMS applications specifically tailored for Banking, Insurance, Manthuring, and Accounting. And it's one of the only

racturing, and recogning. And its one or the only document management systems that will work with PC, Mini and Mainframe environments. So what are you waiting for? Start getting your filing system in shape today by calling the 3M Information Systems Group at 1-800-247-8516.

Arcnet gains market team

BY PATRICIA KEEFE

DALLAS — Three Arcnet ven-dors have formed an alliance to market Datapoint Corp.'s 20M bit/sec. Arcnetplus, scheduled to

bil/sec. Arcnetopus, scheduled to hitp early next year. Joining Datapoint are Stan-dard Microsystems Corp. and NCR Microelectronic Products Division. The three firms said they will provide a range of Arc-netphus products, which will be compatible with existing 2.5M

compatible with existing 2.5th bit/sec. Arcnet connections. At 20th bit/sec., Arcnet eclipses 10th bit/sec., Arcnet eclipses 10th bit/sec., Arcnet eclipses 10th bit/sec. Dibernet as well as 4th and 16th bit/sec. Token-Ring, But the new Arcnet is not likely to shoot past its more popular rivals despite its more popula old Areast technology never be-came as important a standard as did Ethernet and Token-Ring, purtly because Datapoint passed on its chance to open up the then-proprietary Areast years, ago. A wide-open Ethernet stepped into the breach, and the rest is networking history. Arcaset has a strong following among users of mail Novell, for. Netware networks. Gartner Grown Inc. is Standard Cons.

There are two agendas for

There are two agendus for Arcnestphus, according to Frank Daubeck, a network consultant and president of Communication Network Architects, Inc.

The first is to assist a stragging Distapoets. The firm's efgently Distapoets. The firm's efpart is a straight of the str

PDSFAST

It's About Time!

PDSFAST Is About Time and Money Saved by 1 Out of Every 3 MVS Users in the Following Critical Areas.

- DASD/SPACE Management-PDSFAST interfaces transparently with all existing DASD Management systems, reclaiming more space and saving up to 90% of the time and resources used. SPEAK TO ANY OF THE OVER 4,500 CONTRACTED PDSFAST USERS WITHOUT COMMINION INVESTIGATION OF THE ANY OF WILL TELL YOU "NO DASD management configuration is complete without PDSFAST."
- CICS/DATABASE Libraries PDSBAST copies and compresses CICs and batabase libraries in a fraction of the time presently used. Typical elapsed time for a copy or compress of screen libraries, and other similar datasets goes from about 40 minutes to under 1 muter. PDSBAST eliminates unnecessary system downtime spent waiting for copy and compress operations to complete.
- IEBCOPY/SPFCOPY—PDSFAST will replace all batch and interactive IEBCOPY and SPFCOPY/COM-PRESS functions. PDSFAST will save over 80% of the time and resources presently used.

 SMP Processing—SMP and SMP/E both dynamically invoke IEBCOPY thousands of times during a typical run. PDSFAST reduces SMP and SMP/E run time and resource consumption by over 75%.

PDSRAST is now used at over 4,500 MVS installations worldwide. PDSRAST provides a competitive advantage for MVS installations of all sizes, saving many thousands of dollars in data centre resources daily. PDSRAST is also saving thousands of individuals many hours of unnecessary time spent waiting for work to be completed.

Isn't It About Time You Had The PDSFAST Advantage!

For further Information call 1-800-272-7322.



SOFTWARE ENGINEERING OF AMERICA®

WORLD HEADQUARTERS • 2001 Marcus Avenue, Lake Success, New York 11042 Tel: (516) 328-7000 1-800-272-7322 Teles: 6973556 Fax: (516) 354-4015

Products Licensed In Over 40 Countries

IBM keeps Unix effort veiled

years, "This is not the first algo-IBM dated or publicly set an introduction date, but develop-ted the set of IBM conceeded that a 1990 intro-IBM conceeded that a 1990 intro-teger of the set of

multiprocessing version of Unix. Digital Equipment Corp. has the next version of its Ultrix operat-ing system with SMP in field

3090 USERS:

INTRODUCING STOR/9000. YOUR TICKET TO ESA HAS JUST ARRIVED.



MANE		
TITLE		7
DEFT		-
CONTARTINATION		_
TRUST	 	_
COTY.	 	_
STATE.		



Swell

The developers are all over your mini. Which is all well and good, as long as you have another machine for production stuff. But you don't. So your mini bogs down. And who do people complain to? You. Before you know it, the whole worlds on your case to buy another mini.

No problem. What's another \$500,000 out of your budget?



Professional ORACLE* on a PC is exactly like ORACLE on a mini or mainframe. Same toods, same documentation, same everything. Which means anything developers can do on the mini, they can now do on a PC. Only faster. And without slowing down the production system And they can port the new application to the

mini with no changes.
You can have Professional ORACLE for only
\$1,290. Or the Thial Version for \$199.
Which frees up the mini to be what it was

meant to be—a production platform.

And if, after 30 days, you're not happy, send it back for a full refund.

Call 1-800-ORACLE 1, Eat. 8155 to order. And enter the computing environment of the 90's.

ORACLE"

Develop with ORACLE on the PC, instead. Call 1-800-ORACLE I, Ext. 8155.

Register new for the Dracie 1900 International User Neet, Oct. 1-0, Dallas, Texas. Call the number above.

Impact helps soften deadline blow

Y ALAN J. RYA

BOSTON — The jig may be

Plot Executive Software last week amounced Impact, a softmanagement teams address high-priority goals and issues. By using the application, executives can reportedly track progress on a project and will be alerted if deadlines are missed. High-priority goals may in-

ales office, an explosion at a pracehouse or failure to meet with the property and property and

iormation system that Impact will work with, McAniffe and. The short-term insuse can be shagged into the Impact system without help from the information systems department or programmers, be added.

systems department or promers, he added.

The objective is to be able to the system to manage and arol short-term issues that

called in, he said, it could tak weeks to build such a system. B then, the critical issue might a ready be resolved.

The software allows managers to assign reporting tassics of critical issues to specific indivisuals. Managers can specify exactly the information they was as well as the frequency of district updates. The assignment then accear on the Imose

sired updates. The assignment then appear on the Impact screens of designated respondents, who either fulfill the request or assign part of it to other personnel, McAuffile and. The system then tracks requests and responses, appending each indicates when items are due or indicates when items are due or late.

Some of the functions the languat offers may not be using however. Rick Crandall, predent and CEO of Pilot rival Coshare, Inc. in Ann Arbor Michaimed that his company's predict, Commander, will allow executive to set up certain kin of reporting and to be alterted times regarding changes in the

reporting.

Impact will be available in the fourth quarter for a license fee of \$18,000.

EMC to ship 4M-bit chips before IBM

BY ROSEMARY HAMILTON

EMC Corp. is scheduled to begi shipping add-on memory board with 4M-bit chips for the IBB 2000 memory as a scheduled to be

company officials exid lest week HEMC meets in good, it coul best IBM in delivering 4M-b memory chips for its mainframe inc. IBM announced a 4M-b memory option for its Person Systemy2 in July but has yet t release a shipment schedule for

line.

However, the 4M-bit chip which IBM has been producing for several months, will eventually be incorporated across the IBM product line, a company

Toshiba Ltd. will supply E with the 4M-bit chips. Tosh which has also been in protion with the chips, prov EMC with 1M-bit chips the currently uses in its 3090-be

EMC will phase out th boards with 1M-bit chips as ramps up production of the neboards next year

> nally expected, although d not reveal the exact cost





State of the Science

Managing information is a science.

Managing people is an art.

Get the best of both, worldwide, with the IBM System/38 or AS/400 and Financial and Human Resources Management systems from Software 2000.

• The Human Resources 2000 Series

The Financial Management 2000 Series
 Application Manager 2000: The AS/400 Platform of Choice

Software 2000

Mainframe Caliber Software for the IBM Midrange

Software 2000, Inc. One Park Censer - PO. Box 6000 Hyannis, MA 02601

ATLANTA • BOSTON • CHICAGO • DENVER • HYANNIS • LOS ANGELES • LONDON •



fraction of the cost of "tradi-

tional" OLTP platforms.
Oracle has developed new

plishes this using a method which commits the smallest amount of information necessary to complete a transaction. Perfor-

mance is further improved by "piggy-backing" multiple trans-

actions into a single I/O operation.

OLTP applications need to

port a large number of users.

ORACLE Version 6 supports hun

dreds of users by using a multi-

server architecture with a uniq method of row-level locking. This minimizes the possibility of any

users contending for the same

peed and power. That's what it takes to survive the information management challenge. A database management system must be a lot faster than the socalled speeding bullet. But without a powerful support organization and advanced technology to back those mission-critical applications, your business is likely to become Oracle Corporation, the largest

database management company in the world, couples the speed of online transaction processing with the power that comes from 24-hour support, world-wide training and education, comprehensive networking and over 400 full-time consultants. And unparalleled portability of applications from PC's running Xenix to mainframes with UTS.

SPEED

ORACLE Version 6 with trans action processing support combines superior transaction proces-sing performance with high data availability, so that your UNIX

system resources simultaneously But speed is not enough. Your iatabase management company

POWER

Call 1-800-345-DBMS, ext. 8141 today.

at the next Oracle data may ment seminar in your area.

sary for your success. Let Oracle team up with you to outdistance your competition. By providing robust products such as CASE tools technologies to offer UNIX users full support for bit-mapped work-stations under X-Windows, intethe best transaction throughput and response times in the indus-try ORACLE Version 6 accomgrated networking between UNIX and proprietary systems for dis-

tributed databases and processing support and services which have en ranked at the top of the industry by users; and a consu

ing group which will work with you from system design through application implementation. Oracle technology lights the way. Speeding bullets might have been fast enough, yesterday. But nothing in nature can go faster than the speed of light, and no relational DBMS goes faster than Oracle Version 6. Learn how you can survive even the most demanding UNIX environment. Take your best shot, and join us

CANADIAN SEMINARS

DG offers New Wave package

version will run on DG's Aviion line of Unix-based reduced in

Unity plotform to come
While today's amouncement is
sure to please current CEO users who long for a graphical look,
new prospects will be more attracted to the upcoming Unix
platform, said Christine Haghes
at Myriad Research in Mismi.
The CEO Object Office workstratfor must be a Po with as In-

station must be a PC with an In-tel Corp. 80386 or 80286 microtel Corp. 80386 or 802286 micro-processor, at least 3M bytes of Lotus/fintel/Microsoft 4.0 mem-ory, a LAN card, a mouse, a 20M-byte hard disk and IBM's Enhanced Graphics Adapter or Video Graphics Array adapter and display. The Object Office server must run DG's AOS/VS

and display. The Object Office of the opportunity grains and Xodie Tampoor Service. The opportunity grains and Xodie Tampoor Service. COP Relates the pre-theory of the Copy o





Few Things Are As Sure As A Private Line From US Sprint:

As sure as the sun will rise tomorrow, you can count on the private lines of US Sprint."

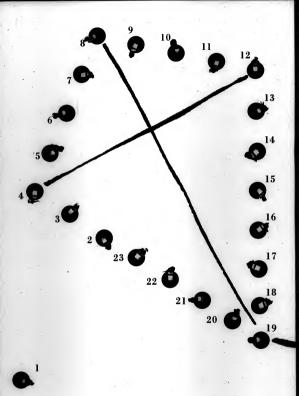
Our Clearline "family of private lines are the only all-digital, all fiber optic private lines to and from anywhere in America.

And they're monitored and controlled exclusively with digital

cross connect technology. So, our private lines are simply the most reliable you can get. In fact, in a recent 90-day period, our users experienced less than four errored seconds per day.

What with rain and fag, even the sum doesn't perform that reliably, And, Spirits in the first and only company to distrib (Micro optic private lines internationally from anywhere in America. So, whether you have vote, data or anywhere in America. So, whether you have vote, data or whether the significant private lines in the significant properties of the significa What with rain and fog even the sun doesn't perform that reliably





Getting a network off the ground is easy with AIX. Because AIX. IBM's enriched version of the UNIX* operating system, brings a whole new standard of performance, documentation and security to

the open systems environment.

Your plans to connect in fact, AIX has improved upon other UNIX systems in up all your systems will fly a lot easier with A

In fact, AIX has improved so many ways, the Open Software Foundation recently chose AIX as

its core operating system.

AIX gives you a very high degree of flexibility. AIX lets you create a transparent network between platforms from a broad range of vendorsfrom SUN° to DEC° to AT&T° and HP.

It also lets you link up a broad range of IBM systems-from the PS/2° to the RT," all the way up

to the System/370°.

All for one, and one for all. AIX can integrate a network so effectively, you'd swear it was a single system.

Distributed Services on the RT lets everyone in the network share files, programs and devices. And to optimize your PS/2 and System/370 investment, AIX's Transparent Computing Facility lets you shift power from one processor to another, as the need arises.

And since AIX allows you to merge DOS and UNIX functions, you protect your software investment, too.

AIX's ease of use also sets a new standard. AIX is well documented, easy to learn and provides connectivity through multiple communications protocols.

So if you want to raise the quality of your networking, connect with your IBM marketing representative or IBM Business Partner today about AIX. The one system that connects the flexibility of open standards with all the classic strengths of IBM.

For more information, call 1 800 IBM-2468. ext. 148. AIX from IBM. Making your business come together.





FDITORIAL

Using the results

e praise at morning what they blame at night, But always think the last opinion right.

T'S ALWAYS RISKY to rush to conclusions hased on opinion surveys; they reflect but a moment in time, as many one-time presi-dential front-runners could attest. With that said, we think that it is worth calling

attention to the contrasts found between two Computerworld surveys: last week's Job Satisfaction Survey of 818 information systems prols and our earlier poll on the perceptions of IS held by 100 top corporate executives [CW,

The surveys indicate that there is a major perception gap between chief executive officers and IS concerning the flow of useful business infor-

A wide chasm exists between the percentions A wide chasm exists between the perceptions among information systems staffers of the adequacy of business information filtering down from corporate decision makers and the feelings of 64% of the CEOs that their organizations could be getting more return on investment in rmation sy

Fully 90% of IS professionals believe knowl-dge about their companies' business is becom-ge more important to them in the performance of their duties. (That one in 10 do not is amazing in this day and age.)

Of those who want to be in tune with their usiness, 51.7% said they are not happy with the resources that companies are providing to clue them in on business matters; 36% of all the sur-vey respondents cited their biggest frustration as either ineffective management, poor communications with management or being too isolated om their companies' busines

Something is going on here, and it does not seem healthy. IS professionals and CEOs, the surveys indicate, are largely in agreement on the portance of information systems to future business success. Top management, however, seems to feel that their information systems workers are not really marching in step with company goals. The workers express frustration about the paucity of business information being used down the line.

It would be naive to suggest that top execu-

tives and their IS staffs get away for a weekend encounter session. But the evidence does seem to indicate that some steps need to be taken to wed technology staffs more effectively with the

usiness planning process.

Now, we are not about to suggest that Roger imith, John Reed and the rest of their poers regularly troop around to glad-hand the technology staff. Rather, the initiative must be taken by topranking IS management, who should try to de-termine the extent of any philosophical chasm existing between their organizations and corporate goals and then develop effective bridge-building strategies.



LETTERS TO THE FOITOR

Remembering things past at RCA

both in the computer systems di vision and at corporate staff. Wilham Harrison's Viewpoint colman Harmon's viewpoint co-umn, "Learning a market strat-egy lesson" [CW, Aug. 7], touched a nostalgic nerve. It's nice to know that RCA's role in commuters is not forgotten.

However, his interpretation of what happened is off. To begin with, RCA's strategy was to be an IBM plug-compatible vendor (in those days it was called a "second source"). The strategy was a good one, as evidenced by Amdahl and NAS for mainframes and the myriad of PC clone ven-dors. It didn't work for RCA for three reasons: 1) bad timing — it was too soon: 2) poor execution: 3) RCA's company culture did not fit the second-source role. Paul Berger

Management Video Programs
Lawrenceville, N. I.

"Learning a lesson in market strategy" [CW, Aug. 7] used the RCA debacle as a positive approach to preparing yourself for a potential lavolf. I have to take exception to several of the points noted in this article. I was one of those managers

that found out about the demis of the RCA Computer Systems Corp. that fateful Friday, First of all, no one on my level had any idea of what was going on. Ir fact, we had all been recently re-assured, via a closed-circuit television presentation by the president of the company, that RCA

When the end came that Fri-day, all middle-level managers were told to hang around after quitting time. After the bulk of the working force left for the weekend, we were herded into

the vice-president's office, where we heard the news. We were then given lists of names of people to be told that they should

personal belongings.
Harrison refers to "mindless and unimaginative RCA strategy." The main reason for RCA's exodus from the computer indus-try can be traced back to a complete lack of strategy. The cor-porate information systems director and his staff were so en-grossed in making names for themselves that they did not too late, and then they threw

too late, and then they threw money around as if it was going out of style in an effort to estab-ish some sort of direction. The problems facing today's firms are not always poor man-agement, as it was in the RCA fiasco. Financial conditions, taxes technology and the overall busi ness environment are frequently the blame for mergers, acquisi

> Herb Gebner Senior Associate Editor Datapro Research, Inc. Delran, N.J.

No pain, no gain

I'd like to comment on the issue of bundling database and com-munications software, which was raised as an antitrust issue in "IBM/DEC: Bundles of pain?" [CW, July 31]. i manage systems d

ment, operations and mainte-nance on McDonnell Douglas hardware, running the Reality Operating System, a proprietary version of Pick. The entire sys-tem is built on the Pick file struc-ture, which includes database management-style facilities such

as hashed direct access and data naries for files.

dictionaries for files.

The integration of the database with the OS is what makes Pick so attractive. The single data model makes it simple for lications to communicate and deach other's files and for ab-

that work with any file that has a ctionary) to be creat So, if a product is a piece of ak, and yet is bundled, will it minate the market? Doubtful. If a product is good, and yet is

ounded, is its domination of the market unjustified? Doubtful. Will some installations use any product that comes from their computer vendor, regard-less of merit? Probably. Who cares? There are always those who fail to make good or thoughtful purchases, and where is the role of the government in

that? Nowhere, I hope.

Martin Goetz, I hope you and
the others who fear IBM bun-dling will think about whether your products can't take the expetition of a giant never nown for innovation. Maybe you ought to be in another business if you need shelter from competition. If you can't provid the service and reliability that will allow you to keep your market in the face of competition. then maybe you ought to go to

work for someone else.

Mark Cashman DP Manages
Anacoil Corp.

Computerworld welcomes com Computerworld welcomes com-ments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor, Comput-erworld, P.O. Box 9171, 375 Co-chittate Road, Framingham, Mass 01701. The AS/400 conto

It's back to bundling for IBM

IBM WATCH PHIL DODA



id have to pay for software.

would have to pay for bottware. The freeble era was over.

Thousands cheered. Well, maybe hundreds. Actually, only the infant independent software industry, the isswyers and Marty Goetz thought unbundling was a great idea. BMY a lawyers we pretty sure that unbundling was mary because they heard the Department of Justice starting to make nasty s, and they were trying to

head off antitrust action.

Large IBM users accepted the new rules unenthusiastically. As there was no immediate budget impact because charges for software were delayed for the first few years, unbundling was put aside as a future problem. Only the universities understood the impact. They knew the days of casual experimentation and loading up systems with lightly used software were over. The erosion of IBM's university computing center business can be di-rectly traced to unbundling.

rectly traced to unbundling.

Here we are, in a flash, 20 years later. The pundits were right about how lucrative unbundling could be. It created an industry with companies such as Computer Associates Interna-

tional, an independent software house with \$1 billion in revenue. But the large hardware compa-nies also resped the benefits. In 1988, IBM raked in a staggering

1988, IBM raked in a staggering.
8 billion in notware revenue.
Even more startling, after
two decades of separately pricing everything in sight, IBM is
beginning to reverue course and
move back to bundling.
Today, IBM sells the
AS/400 computer system with its operating
system and database

run a factory-installed re-lational DBMS written by IBM. It cannot be by-passed, turned off or passed, turned off of overwritten by a prod-uct from an indepen-dent software suppli-er. The AS/400 is not merely bundled — it is

Curiously, hardly sayone noticed, except for that ever-alert IBM watcher Goetz, who said, "Bundling is bundling. Hit's something the user should be buying, bundling precludes something else." Goetz has a narrow, predictable view. More surprisingly, those users who knew what happened did not seem to care and appeared hap-

to buy bundled systems. There is not the slightest evi oce of any user protest. The vened or even expressed any in-

AS/400 is the lack of a need to d it easier not to have to decide between conflicting claims code between connecting claims or tempting alternatives.

The AS/406 design grew out of the efforts of a dedicated group of IBMers who refused to give up their product designs. This group was employed in the

ble alternatives or they don't care. Perhaps one reason cus-tomers are attracted to the

not quit. Eventually, an FS prod-uct, System/38, appeared. System/38 was around for ore than 10 years before Adapso and friends gave it a sec-ond thought. Although the Sys-tem/38 had an RDBMS bundled in, it was only an odd little ma-

in, it was only an ood tittle ma-chine lacking 370 architecture, underpowered and seemingly doomed to a fairly short life. In June 1988, something hap-pened to IBM's ugly duckling; it

development of an IBM architec-tural effort known as Future Systems (FS), to develop a re-placement for the obsolete 370

terest. Congress isn't investigat-ing. Adapos, the toothless tiper, growled a bit but nobody rallied to its side. Even the supremely aggressive sellers of indepen-dently developed relationa DBMSa, who constantly flail each other and IBM, have been Like many research and de-velopment projects, FS dish't quite become reality. The con-cept was too far out in front of the technology at the time, and the technology at the time, and there was no easy migration path for user software. FS went on the shelf as a corporate plan, but the stubborn design group, bused in Rochester, Minn., did not know if there are any possi-

prew up to be the Asyston, as lovely a swan as ever graced. Have a pond. The word west out to those who thought they won the bundling fight long ago: "It ain't over 'til it a over."

min't over 'til it a over."
If IBM gets away with some-thing, you can be sure DEC won't be far behind. Recently, DEC has been offering free run-time licenses for its RDB data-

ustion.

After 20 years, the bottom line is that today, if you want software, it costs money — lots of it. Is it any bet-

expresses any interest in the operating system and utilities. Why? Because today users believe that all they ought to care about its applications. If everything else is embedded in alicon, all the better not because it will run faster and cause less trouble. If IBM moves to more extensive rebundling, it will be surprising if any serious reaction results from the passes. reaction results from the user community. If the AS/400 is the model, those who compete with IBM for software dollars are in for a rough stretch.

And then there was IS



And ICL did rule the earth, plastic pocket protec-tors proliferated and Cobol jock-eys did flock to the promised land

of the data center, for it was air-

conditioned.

And the chief executive officer looked down and said, "Let
there be payroll," and coding
sheets did fly and computers
were fruitful and multiplied (and ded), but none were aware of divided), but none were aware or the DP staff, for they dwelt in the land of ignorance and 360s. And none in DP were aware of the needs of the business, for they thought accounting was the

Great Satan.

And IBM looked down and said, "There must be golden idols in this," and so it brought forth the end user, clad in the woeful rags of computer illitera-cy. And IBM spake of the con-

plates were pried off of data cen-ter doors and "DP" did go the way of the dodo, to be recast as "MIS," leading to rolliching puns such as "MISmanage-ment" and "MISmformation." cept of the information center and decreed that henceforth mainframes would be "user friendly." And MIPS did dance The elders of MIS did take this in before its great blue eyes at stride, for their pocket protec-tors were now lined with gold. \$100,000 a pop. And lo, pop they did, for the mainframes were snapped up

ND ALL ACROSS the land, nameplates were pried off of data center doors and "DP" did go the way of the dodo, to be recast as "MIS," leading to rollicking puns such as "MISmanagement" and "MISinformation."

like gefilte fish at Passover and many cycles were wasted in the great flood of end-user computing, and informational graphics rained upon the land. And softramed upon the land. And soft-ware did proliferate with kingly names such as Ramis and No-mad, and all the people got rela-tional and multiplied. And all was good in the land. Except re-

Then a great rain fed upon the glass house. It began as the first Apple was placed from the tree, but soon became a lorrent. And a prophet called Chapin did energe from the Valley of Hadson and said, "Lo, let there be gody television and said, "Lo, let there be gody television and said, "and a prophet that bore the name of a flower brought forth the 1-2-3 interface. And the end users rose interface. And the end users rose And all across the land, name-

blinked everywhere, and a great phase of mice descended upon pague of mice descended upon the corporate desktop. And the CEOs said, "Yea, these are no mere management took. Let their files be nerved." And the MIS elders did say, "Hey, these are pretty good." And micro-mainframe links

saltiplied, led by the prophet ma. And the "Year of the multiplied, led by the prophet Irma. And the "Year of the LAN" dawned again and again. And the prophet Jobs rose in the West, followed by the pearly Gates who writ the Gospel ac-cording to Windows and was used and martyred for it.

And still none bought the 9370.

And the sign painters were gleeful, and the headline writers did moan, for ooce again the nameplates came crashing down, For the "immangement" began to discappear from "MMS" leaving only "information services," depending on the valley from which you came. And s'un-y-looking acronym was crasted caled "15," which in headlines

("IS chiefs acoring budget wins"). Yet to some, it was called IT, which was deemed mappro-priate by others, for it was the name of a character on "The Ad-dams Family." Yet many achools of thought continued to prolifer-ate in the land. And still Apple

And the elders in the valley of Computersworld, who had by new become really confortable with the term MIS, said. "Jo. go with the flow." And they net and runt their hair with their hands and immented the wors of being in an industry where so much changes so fast. So they decreed that beneaforth this journal shall bestow its favor upon the term IS and use MIS seak in moving lease with a titles. only in special cases such as titles and quotes. And thus you will see

IS" in these pages fores "IS" in these pages lover-more, unless it changes again.

And the people rejoiced and peace reigned upon the land.

And the questions of the day were answered. Except what to do with 150,000 plastic pocket



Remote Control

For data centers that need more than piecemeal solutions.

SAA lets you support more sites, more platforms, and more environments than ever before. But there's a catch: you still have to manage performance effectively across the entire Enterprise system and, at the same time, ensure the highest levels of end user service. Suddenly, partial solutions just won't work.

The task can be overwhelming . . . unless you enter the Center — Candle's OMEGACENTER," an integrated service level management system for today's forward-looking data centers.

OMEGACENTER is a completely integrated solution that

simplifies the coordinated operation of the four essential components of Enterprise Performance Management: early detection, in-depth analysis, automation, and remote control.

At-a-glance Simplicity

The Status Monitor "detects problems in the making and alerts you immediately with intuitive graphics. It provides single-point monitoring of up to 34 systems or subsystems anwhere on your VTAM

network.

Analysis — Once the Status Monitor spots a problem, you can zoom directly into any OMEGAMON® for in-depth analysis.

Two-Way Control

Automation — Candle's AF/OPERATOR™ has the only effective interface to OMEGAMON. This bi-directional connection makes it easy to automate a wide variety of performance solutions — at machine speed and without the need for human

solutions — at machine speed and without the need for human intervention.

Remote Control — When human assistance is required, AF/REMOTE" withly notifies designated personnel so they can solve the problem promptly from a remote ASCII terminal or PC. Because you'll never find peace with piecemeal solutions, Candle has integrated all the essentials OMEMACENTE — where

performance, automation, and productivity join forces. For details, call Terry Forbes or your Candle account representative at (800) 541-8515.

!Candle

SYSTEMS & SOFTWARE

HARD TALK I. A. Savage

Third-party pendors more interested in high payback found with DB2

Baby, you can drive my car

two-seat roadter that even yuppie seems to want for those

noes when it can be driven on a winding mountain road in the summer with the too down - computer servers are often just repackaged versions of workstations or minicomputers. Like the Mista, it's basically the same old engine underneath the new skin.

But vendors, like Mazda's ment, see a brave new market out there, where their products will soon be expected to not only look like a sports can but act like one, too. It would be nice if their servers could sell for as much less than a minicom puter as a Japanese sports car does compared with a Porache.

ins calm and most predictions for 1990 see general es in the electronics indus try, vendors are genring up to flood the market with servers. And they may be more than repackaged minicomputers; they may be the first of the genre with a few Porsche-like comp

hat vendors have been Continued on bare 31

ANALYSIS

BY STANLEY GIBSON

Although IBM's SQL/DS preceded its relational DB2 cousing to market, it cannot compete with DB2 in holding the interest of third-party tool vendors. That has left some users, many of whom long for better SQL/DS performance as well, pining for a wider selection of third-party

Despite the fact that there are more SQL/DS licenses (some 6,000 spread throughout the installed base of VM and VSE operating systems) com

SQL/DS users crave more tools

pared with DB2 licenses (about 4,000 under MVS), software vendors typically gravitate to DB2, whose MVS-based users are willing to pay more than those running VM or VSE. "I would like to see more per-

formance monitoring tools under VM. VSE or both," said Jerry Bruce, database administrator at Seven-Up/Royal Crown of Southern California in Los Angeles. Bruce, who runs SQL/DS un-der both VSE and VM, said that he has no way of knowing abou ne has no way or knowing about levels of activity and usage pat-terns in SQL/DS.

Bruce runs a system that monitors sales trends of the soft drinks that his firm distributes.

Users, primarily sales managers, can extract information from the SQL/DS-based application in a variety of screen formats. Another user at an electron-

ics company in the eastern U.S. said he would like a performance monitor as well. He has filled what was once a lack of SQL/DS referential integrity with a tool sold by Intex Solutions, Inc. in Needham, Mass. He said be Necessary, Mass. He said he started using that tool before referential integrity was offered as part of SQL/DS Version 2.2, which began shipping late last

"DB2 is a glamour kind of product, and you can get more money for it." said Rich Finkel-

Cacago, venour reason tast; would cost about the same to de velop for SQL/DS as it would DB2, but the amount they could charge for an SQL/DS utility would be much less. Som ground, however, could be made in larger volume and greate market share because fewer

etitors and a few softwar ors such as intex have led the opportunity ar whed to fill the void.

VM Systems Group, Inc. in lington. Va., recently intro-Arington, Va., recently intro-duced a performance monitor that it claims is the first on the market. It also has a full-scree application designer under which Rexx can he used to develop an application. Other vendom have deferred SQL/DS development

ins for the future.
"We are not writing for Continued on page 27

DG's Aviion: Hospitals seek it as IS remedy

BY MARYFRAN JOHNSON

WESTBORO, Mass. - Data General Corp.'a new line of Avison workstations, servers and systems is moving briskly into its own niche in hospitals and research settings.

DG is also working to over-come a traditional hurdle facing

reduced instruction set comput-ing (RISC)-based machines — a lack of software - with recent ouncements that bring the total number of software ven-dors allied with the computer

mpany to 35. Avion 6100 servers ber

Avison 6100 servers began shipping this month to sites such as the Hamilton Civic Hospital in Ontario and Frederick Memorial Hospital in Frederick, Md. At Hamilton Civic, data pro-cessing manager Jean-Caude Carriere was waiting as impa-licable as a consected father

tiently as an expectant father.
"This has been a 15-month wait
for me," Carriere said, explaining how the news of DG'a alli ance with Motorola, Inc. Inst year initially drew his atte to the new generation of RISC based machines running on the

Motorola chip. Hamilton Civic and its sister hospital, Anderson Civic, have a total of 1,100 beds. They also share an overloaded computer system based on four other DG

machines from the proprietary

Information sharing
The addition of servers will enable the hospitals to set up an integrated local-area network, with 400 terminals added to the current 300. It will also auto mate hospital functions in the lab, nursing stations and offices abling systemwide informa-on-sharing never possible be-

Discharging a patient, for ex-ample, will require one comput-er entry rather than phone calls to nine different bosoital depart-

ments. "We may not save pe ple's lives, but we will have pe ple under better work conditions, with less frustra-tion,"Carriere said. The choice of the new tech-

nology saved an estimated 30% of the total project cost — about \$1 million in Canadian currency — allowing him to cut maintenance costs, and provide more computing power and storage space, Carriere said.

Continued on page 28

Obsolete IBM compatib are not so obsolete for so users. Page 25.
Performance remains at



PLATINUM REPORT FACILITY

DB2 Report Writer for CICS and TSO

PLATINUM REPORT FACILITY overcomes OMF's

- Easy to Use. Generate queries and reports using a comprehensive menu-driven system.
- Moltiple Environments. Execute under CICS, TSO, and batch.
- Performance. Optimize resource consumption (memory, spill file, and data) by user and by en-vironment. Under CICS, use the Activity Monitor o control and manage PRF usage
- Online Report Display. View the full page layout including headers, footers, and sub-pages. Use the PREVIEW feature to simulate the report data without accessing DB2. Set row limits to reduce the amount of DB2 access for online report review.
- Multiple Report Types. Utilize up to five report types (column, label, letter, block, and free form) to fulfil your reporting requirements.

PLATINUM REPORT FACILITY. A burst of spices dor in the DB2 jungle. From The DB2 Company." Call today for more informati PRODUCT EVALUATION:

> 1-800-442-6861 1-800-848-0140 (In Canada)

PLATINUM technology, inc.

The DB2 Company" (312) 639-5300



A Burst of Splendor in the DB2 Jungle

You wouldn't build a house on sand. So why build your company's critical systems on uncertainty?

FOUNDATION.

The Proven CASE Solution.

Information systems, like houses, require the right plans, procedures, and tools for proper construction. Otherwise they could come crashing down around you. FOUNDATION software from Archar Anderens & Co. helps you put your house in order with premier technology and a proven

offs you put your house in order with premier relunology and a proven memory for gapitations development.

FOUNDATION is the automated, full life cycle CASE solution flat proventies of gapitations of complete the complete of the complet

lay out your own blueprint for success, with optional education programs. All modeled from over 35 years of that only Arthur Anderson & Co. can provide, can put your systems on solid ground.





Company

Accress show: ☐ Home ☐ Bunness ☐ New ☐ Renew Basic Rafe, \$46 per year "US Only Caracia \$110, Central South America \$130, Europe \$150, all other countines \$255 Foreign orders must be prepaid in US - Solars.

-

lease complete the information to the right to qualify for this special rate COMPUTERWORLD



YOU INDIVINUES I ASKED TO BORROW YOUR COMPLETENANCED I SORT OF HORED ID GET THE WHOLE THING AT ONCE."

YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of \$44.00° per year — a sawngs of 57% off the single copy price. In addition, I'l receive special bonus sections of COMPUTERWORLD Focus on Integration. Last North

77. Company

ss shown | Home | Dusness rmetion to the right to qualify for this special rate

* WILE-PURCHISH Gross one:
Initials of includent and initials of includent and initials and initials are initial and initial a

of the state of th

E4935-X

 **TILE PROCEEDS (Jones one)
 **SELDY MANAGEMENT
 **SELDY Ton Passage A



BUSINESS REPLY MAIL FIRST CLASS PERMIT NO 55 MARION, OH 48306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044 Marion, Ohio 43306-2144





BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO 55 MARION, OH 43305

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044 Marion, Ohio 43306-2144



SOFT

TALK

Daniel O'Connell . Razing

structured approaches



h methodologies — the n design method, for ex-— work quite well for most business applications but are not well-suited for technical or scientific projects. Object-ori-ented design, however, prominted design, nowever, prom-ises real improvement in the de-sign of technical systems such

utilities.

The top-down approach assumes that all software systems have hierarchical relationships, which can be graphically represented through structure charts, data-flow diagrams and the like. Terms like "boss" and

the like. Terms like "boss" and "worker" are frequently used in these methodologies. Here is the problem: In many technical software pro-jects, hierarchical relationships are not easily determined and in-deed may not exist. For exam-ple, iron or aright respect a oreen may not exist. For exam-ple, one can easily represent a payroll system through a series of modules drawn on a structure chart with higher level modules controlling those at a subordi-nate level. However, what if

The wrong horse to bet on

They served well, but these IBM blug-compatibles have had their day

BY ROSEMARY HAMILTON

For many users, an era ended his year when they threw in the towel on obsolete IBM-compati-ble mainframes made by forgot-ten computer makers with such names as Magnuson Computer Systems, Inc. and IPL Systems,

Inc.

But these systems — the mainframes that couldn't — apparently did provide several good years to their small user populations. Most users interviewed recently said they had long been happy with the lard-ware itself. But they finally gave in because they needed more can because they needed more can be come to be a severe unknown to their third-party maintenance.

provider.
"We got five years out of it, and that's about all I can ex-pect," said Andy Jensen, MIS di-rector at Emco Distributors in Fremont, Calif., where IPL hard-

expect to get another year out of these small mainframes before they must move to a bigger sys-

tem.
One user does not see any end
for his Magnuson: It is now being
used strictly as a table for operator consoles. But Frank

Gateway Information Services, lnc., a service bureau, said the Magnuson served its purpose before becoming a piece of furni-ture four months ago. "We could have gone to VM [on the company's IBM-compati-ble equipment] and run DOS un-der that, but keeping the Magnu-son was chesper than that," McMarry said. "We were using it for some DOS compiles, but

lately it was becoming an expen-sive luxury for six or seven com-piles a year."

'It doesn't cost much to keep it, "It doesn't cost much to keep it, and it just stays tucked in the corner, humming away," said Michael Stamp, vice-president of technical services at Compu-tations/Dyer Wells, Inc. in Atlan-

faced in other businesses such as the messory add-on market. While hundreds of other users have long been associated with more successful PCMs such as Amdahl Corp., members of this

ta, where a Magnuson system is used to support an external client and two requires the IBM VM and VS-Ricognessing systems are very extense a group that tooks chance on the wrong pile; and the strength of the result of the resu

But they bailed out in differ-t ways. Some were bought up other companies. Magnuson,

stall."
Several users sites were util enough that their systems fered enough computing carety for several years after the under faded from the

ignated the obsolete machine a specific task so that the ere not dependent on it for day-day operations but still got

were not be expensioned but still go to-day operations but still go The only problem cited by some users was maintenance. It several cases, users signed up with a thrie-party provider that took over the maintenance re-frame impliers. Most of these users reported no big problems with the changeover, but a few and the third-party provider just did not have the expertise for the Still others said they took or the maintenance themselves. It



If Service Were Something You Could Touch. You'd feel the Lawson difference. Our clients do. That's why they tend to stay Lar

As introviolgrable software buyers, they chose Lawron for full-featured, easy to use applications. Combined with the latest in software technology.

But they stay with us for the service. With a goal of 100 percent client satisfaction, Las often every service you need to ensure successful implementation ... including a 12-st money-back performance guarantee.

LAWSON

nitrible in the U.S., Canada and overseas. For your IBM midra

Meet the #1 Software for a Growing Family

The more you rely on the expanding family of VAX" computers, the more you need the SAS" System—the leading data analysis and graphics software in the VAX market. No other software has the nower and flexibility to handle all your data management, analysis, and presentation needs. Across the entire range of VAX systems. The SAS System brings

you more choices for data entry. retrieval, and management... report writing and graphics. . statistical and mathematical analysis (including quality control)...business planning. forecasting, and decision support...operations research and project management...and applications development. All fully integrated. All backed by VMS-specific technical support. training, and documentation.

And now we've extended the family with specialized tools for evaluating VAX computer performance, as well as interfa to popular data bases such as ORACLE® and Rdb." No wonder experts call the SAS System

"...perhaps the most sophisticated and versatile family of products on the market."*

Yours for 30 days. . . FREE

Find out why the SAS System is the software you won't outgrow.

Ask for our free 12-page executive summary and details about a free 30-day software evaluation. Call us today at (919) 467-8000. In Canada, call (416) 443-9811.

digital

The SAS* System. More Choices for More Applications than Any Other Software.

Command performance

SQL/DS

BMC Software, a vendor of DB2 utili-ties in Sugar Land, Texas, considered writing for SQL/DS but rejected the idea, believing that more than half of SQL/DS users are running on VSE and that most of those are in Europe. "But even the VM BM HAS CONSIDERED DB2 more strategic for some time, IBM supported SQL/DS out of necessity.

RICH FINKELSTEIN CONSULTANT

MC. Cordell added that BMC does not lieve that SQL/DS is "industrial rength." She mentioned one user's 20-

strength." She mentioned one user's 20-million-row application that was failing, Cordell noted that 20 million rows is not large for a DB2 database. The dearth of third-party utility sup-port is reflected in less consultant atten-tion as well. "SQL/I/S has never had the consultant support, either. There are

Finkelstein said that the lower pr of SQL/DS is partly IBM's doing: " of SQL/DS is partly IBM's doing;

has really been downplaying SQL/He wanted to start an IBM SQL
group in Chicago four years ago, and
told him not to include SQL/DS to
only DB2 users. "IBM has consist
DB2 more structure,"

A Strong CASE for Choosing Pilot Over Comshare.

> PILOT ANNOUNCES INDUSTRY FIRST Advanced EIS Code Generate BOSTON-Pilot Executive Software Real corporations using real systems,

> > State

Innovation has made us a strong competitor. We developed the first commercial Executive Information System in

cooperative processing architectures, time-series relational databases, dynamic menuing and packaged EIS

1984. We pioneered

applications. Now we're introducing our new line of EIS/G" code generators that eliminate up to 80% of the development and support costs of an EIS - the first application of back-end

CASE tools in the EIS industry. This innovation lets you generate executive applications faster and with better codeintegrity than any system the competition

Leadership, There's an old New England saving: "The empty wagon rumbles the loudest."

Real leadership is not won by words or claims. It's built on references.

Ask for our complete user list. Then ask Comshare for their list of "10,000 EIS users," If you want to see more, sign up for one of our hands-on workshops. You'll be able to build your own CASE for choosing Pilot.

For more information, call (617) 350-7035. Or complete and mail the coupon below to: Pilot Executive Software, 40 Broad Street, Boston, MA 02109.

	P	at me on t	he CAS	F	
☐ Plean	ne to arrange e send me o ES: The Me	an on-site de	ports FIS	n or have from the l	ls-on worksho MIS Perspecti
Name			_		
Company					

SEPTEMBER 18, 1989

EXECUTIVE SOFTWARE

O'Connell

CONTINUED FROM PAGE 25

the system to be constructed in a concurrent C compiler? It would be difficult to represent this system with a structure chart. One cannot easily represent a communications protocol or concurrent operating system facility using such tools. Like a tight pair of shoes, the methods institute of the control o

sike a tight pair of attoos, use memora-ast do not fit.

In technical projects such as these, he data structures being manipulated an essed between components are the levy of developing a functional system. For his reason, the object-oriented ap-rouch works well for these systems. Us ag this method, a designer would view

the components of the system as objects and object classes, which the system ma-

An object is a specific value within a class — Professor Jones would be regard-ed as an object. A class, however, is a set of all like objects — professors is a class in

or an use depicts — projectory in a cross at this example.

Let a take the accepted programming notion of a queue, a data structure that is to be processed in certain defined ways. By adding functions in the queue, we can turn it into an object-oriented class.

We can add such functions as Enque,

add an element; Deque, remove an cle-ment; Fullque, check to see if it is full; and Emptyque, check to see if it is empty. The queue, now a class, would be ded as a data type conta ning the de

fined functions Enque, Deque, Fullque and Engreyque.

With the object-oriented approach, we view the class in terms of the services provided by that class without involved growing the physical implementation — that is, an experience of the proposed by the proposed by the proposed by the proposed in th

ing a software system by implementing a series of well-defined classes. series of well-defined classes.

In reality, a computer system manipulates data structures. We have simply defined them as classes of objects to allow flexibility in the choice of the physical implementation. Viswing a software system in this manner, we can handle all software projects and not just those that

can be represented hierarchically. Notice that complex concepts such as concur-rency can be handled using this approach. This is important, considering the indus-try's trend toward massive parallelism.

and the use of concurrent progra nguages such as Ada.

anguages such as Ada.

Classes relate to one another. Each class has a number of services from which other classes may choose. This mechanism provides a powerful design tool for most software projects. For example, modern committee committee to the contract of the committee committee to the com most software projects. For example, modern computer operating systems are built upon a client/server model. If an op-erating system process requires a specific service, it requests the service from the propriate server software. Each server ald be a class of objects that could pro-

would be a class of objects that could pro-vide the requested service.

Although not yet widely accepted,
the object-oriented approach appears to
offer great improvements over current
methodologies.

O'Connell is an assistant professor of computer ac ence at the State University of New York at Fre-donia and a database consultant.

Aviion CONTINUED FROM PAGE 23

Dollar savings and performance were also a drawing card for Frederick Memo-rial, which spent "just over \$2 million" to revamp its computer system, said Tom Powers, the hospital's director of data

processing.

The 233-bed hospital will begin later this month to install four 6100s, each broked up to an Ethernet LAN for up to 300 terminals. The Avisons will replace the present odd mix of hardware, which is neheduled for mothballing.

At the Ontario and Maryland bospitals,

At the Ontario and Maryland hospitals, the laboratory, nursing station and office automation software comes from Medical Information Technology, Inc., in West-wood, Mass.

wood, Mass.
Maintaining an environment computable with Meditech and war was a key element in choosing DC, the managers said.
The 25 various hoopful applications from Meditech also run on Digital Equipment Corp. machines, but DEC's RESC line was nitroducted until ally!
Both data processing managers did their performance analysis on the Avision 5100 at Meditech's handsquarters, which served as a beta-test side for the processerved as a beta-test side for the processor and a server of a second and control of the processor and a server of as a beta-test side for the processor and a server of as a beta-test side for the processor and a server of a server of as a beta-test side for the processor and a server of as a beta-test side for the processor and a server of as a beta-test side for the processor and a server of a server of as a beta-test side for the processor and a server of a ser

aors.

At Carnegie Mellon University's Center for Excellence in Optical Data Processing, Ph.D. candidate Eticene Barnard is finishing his thesis using the Aviion 300 workstation.

The electrical and computer engineering student chose the Aviion machine over Sun Microsystems, Inc.'s Scalable Processor Architecture station and the Decatation 3100 because it packed "more computational power." But Barnard add-ed that be is waiting for a wider choice of

ed that be is waiting for a wider choice of oftware.

American Medical International, one of JGG's largest customers, is looking more closely at the Avison line even as its Los Angeles-based data center upgrades to DG's proprietary high-end MV40000.

"The appeals is the performance of the (RISC-based) machine," said Scott Ward, a senior systems programmer. "But the concern is moving [DG's] AOS/VS into the Units-based centrionness I vou can't to the Units-based centrionness I vou can't

HYDRA II FLEXIBLE = RELIABLE = EXPANDABLE

Direct Channel Attached Protocol Converter/Controllers From JDS MICROPROCESSING

annel attached HYDRA or products provide superior flexibility. They allow local or remote PCs, ASCII terminals, ASCII printers, and or remote PCs, ASCII terminate, ASCII printers, and dawny other ASCII devices to communicate with mainframe applications. Users can disk-in and access mainframe databases and electronic mail, check on mainframe operations, transfer files and retrieve reports. And, regardines of the application, you can feel secure. Multi-ferel password security, positive log-off security, and call-back socurity can be custom to the control of the control of the custom process of the control of the custom and the custom process of the custom and the custom process of the c

More than ten thousand ASCII devices located in large and small data processing centers depend on the reliability that JDS products provide. Transpor-tation, financial, manufacturing, retailing, engineer-ing, overmment and educational institutions are among various industries that rely on channel-

ions Ltd. Ptr. England (902) 251-466

attached HYDRA products for their ASCII connectivity solution

Best of all, JDS products expand to meet the demands of your connectivity needs. Support for as few as four ASCII devices or as many as 64 ASCII devices per HYDRA is available. As your company grows, you can upgrade any model to support up to 64 devices and then attach multiple HYDRAs.

JDS MicroProcessing's line of HYDRA products attach to IBM and compatible 43XX/30XX and 8370 CPUs. To discover more about JDS MicroProcessing products call 800-55-HYDRA. In California call (714) 779-2283.



ETHIOT CONTROLLED TO THE PARTY OF THE PARTY

Sure it's a strong 3270 network. But is it moving your information fast enough?

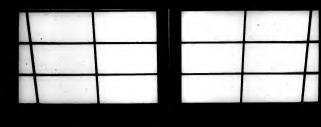
No matter how finely you have tuned your system, or how often you've invested in hardware and telecommunications upgrades, information never moves fast enough for today's data processing demands. Except when you install 3270 SUPEROPTIM/ZERIP from BMC Software, Inc.—the one-time solution for response time problems.

BMC's patented technologies of IMAGING™ and input Suppression' assure you the maximum optimization of outbound and inbound data streams, which means messages travel faster across existing lines and process faster with existing hardware. You'll see up to 55 percent data stream reductions on local and remote 3270 networks, depending on the environment. 3270 SUPEROPTIMIZER is available for MS, CICS, TSO and VM. You can have a dramatic response time improvement in less than one hours time. To learn more, or to begin a 30-Day-Plus Free Trial of 3270 SUPEROPTIMIZER, complete and return this coupon, or call BMC Software, Inc. at 1-900-841-2031; in Toxas call collect, 713-240-8800.

BMC

BMC Software, Inc. • ,P.O. Box 2002 Sugar Land, TX 77487-2002 MC Software also has offices in France, Italy, pan, the United Kingdom and West Germany. BMC Softwee, Inc.
P.O. Ber 2000 - Super Land, Teams 77487-2000
Consist me Back.
The Season - Super Land, Teams 77487-2000
Consist me Back.
The Season - Super Land, Teams 77487-2000
Consist me Back.
Super Land, Teams 77487-2000
Consist me Consist Medical Consistence of Consist





How to speak high-tech with the Japanese.

An action seminar for U.S. companies. It is not enough to be sharp. It is not enough to be powerful. Emering the Japanese high-tech market is a game of subdety, innovation, and understanding. And, as a top executive in your company, it a game you must win to keep your company, it a game the global marketplace.

say, the same you man wise heep your company compation in the global malterplace. **The restaining ALLIANICE AJANN** of Cabother, 6, 1989 - Heed Hillian-San Francisco,
ALLIANICE JAPAN** has be the rest important confirmer in the high sich indexty in the ser of the rest.
ALLIANICE JAPAN** has be the rest important confirmer in the high sich indexty in the ser of the rest.
More that a confirmer.* ALLIANICE JAPAN will be a notion sension with genetic higher has the confirmer. ALLIANICE JAPAN** will be a notion sension with genetic higher has the sension of U.S. lightests companies in Japan sension of the sen

Alliance '90: the process continues. The ALLIANCE JAPAN Conference also georides visal prepara-tion for the Alliance '90 conference in Tokyo (Jasusay)' Il to Tebusay' 2, 1990). A vital forum for lunching your core pury in Japan. Alliance '90 provides a unique face-to-face meeting with key decision-makens from Japanese companies And ALLIANCE JAPAN can prepare you to make the most of this opportunity.

One call could change your company's future. The information you will receive at ALLIANCE JAPAN init just current and comperhensive; it essential. If your company is planning to enter the Japanese market, or wasts to make an existing operations associets, you must stord ALLIANCE JAPAN Cell bades, your company.

Call ALLIANCE JAPAN Today • 1-415-863-5074. Or FAX: 1-415-621-8038.







Savage CONTINUED FROM PAGE 23

CONTAINED FROM FROM 6
doing feet the large were no in to take the
gata of a workstation or minicomputer,
add networking software, repectage it
in a tower and content a newver.
In doing so, prices are topologies it
ange widely. Not one in the industries
ange widely. Not one in the industries
ange widely. Not one in the industries
to the intervent in and what it should
do. But as wendom runk of 80 the growing market, classes of servers will start to

rm.
The newest class will be the Porsche te servers streamlined to do only serve nctions — not repackaged minicom-

puters. Soon — probably first in a half-dozen start-ups by the end of the year — you? I see servers with some specialized hard-ware took as channel processors to his-manage memory, for ed these is made by Netfranse Systems in Sannyvale, Calif. It is no proposed to be Netware servers. Similarly, workstation vendors, such as San and Compae, will move up in the years marked by parting their work-

Wrong horse CONTINUED FROM PAGE 25

The Howison Fart disconnected in Maganusco computer this namer after Maganusco Computer the Summer American Computing Power, plan it became about 1990 and 1 The Houston Post disconnected its

ing Magnuson became more difficult to maintain. Also, additional capacity became a more pressing concern. The two issues together led the Port to decide on an IBM 3061 as a replacement.

Not done yet Other user sites, however, say their obso-lete equipment has at least several more months to live.

months to live.

Stamp at Computations/Dyer Wells asid be expects to keep his Magasson usid in least the end of this year. He said the asid the expects to keep his Magasson was the said to the said the said the said that the s

Stamp said the cost to mainta nuson is low. Having paid for it in full, a no monthly lessing charges. stations in a network server environ-

ment.
Dataquest's finger-on-the-pulse indi-cates there will be many new server prod-ucts by the end of the year as product lines, which now often include only one product, are broadened. This is because corporations want their users to share re-

isolated individuals.

Now, as repuckaged minicomputars, servers have too much capability, according to some who make minicomputers such as Hewlett-Packard. To be cost-effective, the mini will be stripped down.

As the hardware slims down too Minicolate, is the cost will allow down and specializes, the cost will allow down and specializes, the cost will allow down and specializes. Oncelands, you president and general oelandts, vice-president and go anager of HP's Computer Sys

Group, predicts that in two or three years, servers will be half the price they are now. Servers currently run the gamut, between about \$12,000 to \$125,000. In addition to operaismod CPUs, expect servers to have specially built cards for graphics, high-speed compatation, printing, files and distabases. Not every vendor expect to be

wept up in the sports car server line.

dips Computer, one of the early entries
the server market, is reserved. It could
treamline but sees no need to; instead,

will be goosing the power of its cu

eless, servers are evolving ernational Data Corp. analy

tions. The cap on the server market in that corporations are likely to be conservative using networks. Sure, a work group or office should be tied together, but how many work groups should be share the same data? Then, of course, the office political agent of comes into play, in which management down to watto a have what has been developed in one area with another group that could leech and leverage from the information.

are in a Computerworld West Coast corre

Before System 1032, 24 years and 1 trillion bits of interplanetary data were lost in space.

When the recently launched Magellan space peobe reaches Vern in the summer of 1990 to map the planet's surface, it will collect more than I trillion bits of data. That is from all the previous planetary probes combined.

According to Dr. Raymond Arvid According to the regiment servis-son of Weshington University in St. Louis, the successful use of this re-duce all gets down to System 1002 from CompuServe Data Technologies only one in the world that does what it

does " mid Professor Arradices As Arvidson discovered, System 1032 4GL/RDHMS software modify handles his record breaking amounts of data at record-breaking speeds

noothly Eurily Along with the team from the Department of Earth and Planetur

Sciencest American user System 1077 to catalog and access vast amounts of digital data from past and present 150,000 irrastes and 500,000

data weren't cataloged or readily accessible. So trying to find a parti

it mucht not be found at all. Using System 1002's browne capa blisty, the database can be easily generated and data quickly displayed

or example, a data search that might are taken 40 hours before System

have taken 40 hours before System 1022, can now be done in Just seconds If your large, sophisticated RDBMS application leaves you lost in space, here is how to find the answer: Think Big, Think Fast, Think System 1022.

CompuServe Data Technologies

1-800-USE-1032 Ext. 500

Think Big. Think Fast. Think System 1032.

NEW PRODUCTS - SYSTEMS

priced at \$5,600; dual packages range from \$14,000 to \$15,500. A larger RF71 RSE, supplying 400M bytes of storage, is also sarelishin. also avai

111 Powdermili Rd. Maynard, Mass. 01754 508-493-5111

DSP Systems Corp. has announced a 20-MHz multimode memory board reported-ly intended for high-speed digital signal-

nording to DSP, the DMEM-512 to static memory that

words of linearly addressed 16-bit-wide memory space. The board is said to be ca-pable of operating as a frame store, ac-quiring data from either of two 16-bit inquiring data from either of two 16-bit in-put ports, or as a continuously running-variable-length delay line. It also can re-peatedly, or in a single shot, send a stored pattern to its output port, the vendor said. The price in \$7,500 in small quantities.

DSP Systems 1061 N. Shepard St., Unit-C Anaheim, Calif. 92806 714-630-1330

General Business Technology, Inc. has announced a greaming-tape drive that features a 150M-byte ¼-in. tape car-tridge compatible with IBM System/36 models.

The GBT 4357 features una operation using a system timer and pro operation using a system timer and pro-prietary, menu-driven software. Accord-ing to the company, standard IBM proce-dures are used for attaching and backup. The drive is compatible with the 60M-byte IBM 6157 streaming-tape drive, and at insures data integrity through the use of read-after-write procedures with auto-

matic error correction.

Available now, the drive sells for \$1,995 and is backed by a one-year re-

placement warranty.
General Business Technology
1891 McGaw Avenue Irvine, Calif. 92714 714-261-1891

I/O devices

Versatte, a mit of Xerox Corp's Engineering Systems Division, has monuscul a graphical processor for la electrostate of a graphical processor for la electrostate.

The Medical Side processor was reportedifferent for the continue of the Side processor was reportedifferent to provide sold provide size yielder to provide sold provide sold proting unitary and a proprietary picture to provide sold provide

forms.
With additional memory op able, the controller is priced at \$24,750.

Versatoc 2710 Walsh Ave. Santa Clara, Calif. 95051 408-988-2800

Human Designed Systems (HDS) has in-troduced a line of display devices designed to run X Window System-based applica-

ns. The HDS Viewstation modular f reportedly implements the X11 window-ing standard to support monochrome and color displays, which are available in a va-riety of screen sizes and resolutions, the

All units are said to be built around a 10-MHz Intel Corp. 80186 processor and 10-MHz Intel Corp. 80 186 processor and a T1 34010 controller for graphics. The display devices an lot nev two students estail ports that support communications at speeds up to 57.68 bit/sec. Prices range from \$1,990 to \$6,999, depending on configuration.

3440 Market St. Philadelphia, Pa. 19104 215-382-5000

Five dot matrix printers have been added to AEG Olympia International'a product

line.
The additions reportedly include three 24- and two nine-pin printers. The 24-pin printers offer draft-quality print ranging from 200 to 240 char Jace. or letter-quality with either 67 or 80 char Jace. Prices range from \$599 for the most basic model to \$1,049 for a wide-carriage color ver-

The mine-pin models include the NP 80SE — a 300 char./sec draft, 60 char./sec. near-letter-quality printer listed at \$499 — and the NP 136SE, a wide-carriage 136-col. printer priced at \$699. AEG Olympia Box 22

COMPRESSION FOR

1 % THE QUICK **BROWN FOX: #** [010!C?%1234 56789011ABCD EFGHIIKLMN OPORSTUVWX



With INFOPAK. this simple concept is finally simple to use

TEST IT FOR YOURSELF!

Get a resitetic look at the improve-ments INFOPAX can make in your DASD space utilization, Ask for a free TESTPAX program. Pun it against your existing data bases to determine the DASD space gains you can expect. Contact Infolial today Info Tel 14006 Winding Creek Court Rules 101D Temps, FL 33813

TWERE TWO

COMPANIES

WHUSE

AND HUMAN RESOURCE

OFTWARE

Consistently

ONIN

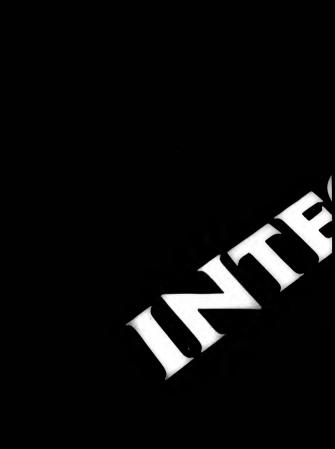
HEAD-TO-HEAD

MLATIONS

ISA AND

IcCormack

[)()[)(]





Now THERE'S ONLY ONE.

Presenting integral — the joining of the financial offorwar expert Brita Design insociales, and the human resource soft-war experts integral Systems. On our own, we were both winning over 87% of all orelutators among ISSA continues. Toggetier, we're unbeatable, Why? the cancer we provide the most advanced and access we provide the most advanced and challing proven SAA-compilant offsiture for both materiams and mid-range systems. All with unspreaderful support. Now that there's one less company to choose from, there's really only one choice: Integral.

Call today for your free video on the new force that adds new meaning to financial and human resource software: 800-824-8198/ (in California 800-824-8198/ in Canada 415-939-3900), Or write: 2185 N. California Blvd. Wathut Creek. Cl 94596



INTEGRAL

NEW PRODUCTS - SOFTWARE

nce Corp. has announced an appli-development tool aimed at the IBM size marketplace. size 1.5 of ART-IM/MVS permits

version 1.5 of ART-IM/MVS permits developers to embed expert systems ap-plications within traditional applications software residing in the IBM MVS oper-ating system using TSO, IMS and CICS teleprocessing mentions.

ma, syment using TSO, IMS and CiCS teleprocessing monitors, the company said. Written in C, ART-IM provides a hybrid rule and object representation language. R can directly access IBM's DB2 and a variety of third-party databases.

The first-copy price is \$100,000 for runtime. Quantity discounts are available. Inference

Inference 5300 W. Century Blvd. Los Angeles, Calif. 90045 213-417-7997

ac Corp. has upgraded its software ductivity tool kit used for the mainte-ce and enhancement of existing sys-s, data administration and reverse en-sering of new systems on IBM MVS-methle mainfrances.

genering of owr systems on BIM MVS-Release C300 of PMSS reported by Males and C300 of PMSS reported by subyess the impact of implementing sys-mess C400, PM, and ALC programs and can help establish and enforce pro-The express includes these options a CSS interface; Design, as option that such a company of the CMS of the territory of the CMS of the A first year Kenne for either the C400 of T41/1 ALC version casts 375.000 or F41/1 ALC version casts 375.00

Adpac 340 Brannan St. San Francisco, Calif. 94107 415-974-6699

XDB Systems, Inc. has amounced SQL support for its software that enables per-sonal computers to be used as a develop-ment platform for IBM mainframe DB2

ment pateren for IDM maintenas DES applications. DES applications. DES Maintenas DES applications. All paters are also described to the first in which the SES compatibility mode from multiple attandance, can expirately support IDM's maintenance IDES Character net instead and control and the second and the

Applications packages

Applied Dynamics International (ADI) has reportedly upgraded its simulation language to include a range of vector and matrix operations that simplify mathematical modeling.

Called Adsim Version 7.0, the simulation language is said to help engineering and scientific users of the ADI System

Peatures of the Application Visualiza-tion System Release 2 reportedly include the capability of visualizing geometric, image and volume data sets; a network editor; an application builder; and support for direct, real-time coupling of user com-putational programs into the visualization 100 to group variables together for sim-plified input and output to external hard-ware devices for graphical display or for The program is bundled with Stellar

data logging. data logging.

Automatically included as part of the ADI System 100 dynamic-simulation computer system, a typical configuration costs approximately \$350,000 to \$450,000, the company said. Existing System 100 users can upgrade by puroing software mainte

An adaptation for Digital Equipm Corp.'s VAX systems is also available. ADI

ADI 3800 Stone School Road Ann Arbor, Mich. 48108-2499 313-073-1300

SAS Institute, Inc. has enhanced Neovisuals, its three-dimensional graphics and assistation offorware peckage. Release 4.5 features a computer produce metallic convention that the product of the convention of the conventional products from any data or two-dimensional systems, the vendor said. The software runs on several platforms, including Digital Equipment Copy. VALVINKS systems, Reselect-Packard Co. v. 36000 series. 350 SKR (turbo) and San Microsystems.



phics supercomputers at no charge. sting customers will receive free up-

grades, the company said. Stellar Computer 85 Wells Ave. Newton, Mass. 02159 617-964-1000 The first-year license fee for the Neovisuals base component ranges from \$750 to \$13,800.

CACIONI P.O. Box 8000 SAS Circle

Cary, N.C. 27511 919-467-8000

The Siggraph Association for Computing Machinery, Inc. has introduced a 60-minute videotape that review state-of-the-art computer graphics hardware and software technologies, the company said.

According to Siggraph, the Visualization/State of the Art:Update video was

produced by Pacific Interface, Inc., an inmational graphics consulting firm, and hides interviews with 14 computer graphics experts regarding current mar-ket developments and future trends. The tape is available to Siggraph members for \$95 and nonmembers for \$195 in VHS

Siggraph ACM Order Dept. P.O. Box 64145 Baltimore, Md. 21264 800-342-6626

McCormack & Dodge Corp. has an-nounced four computer-based training (CBT) products developed for selected Millennium financial software systems. The CBT products include AR:M Cash

Application, GL:M Journal Processing, AP:M Voucher Entry, and Fundamentals of Millennium. Users may train at their muneumnum. Users may train at their terminals or at personal computers with simulated M&D systems, the company said. The programs are available in versions for both IBM FCs and mainframes, and site licenses range from \$7,800 to \$19,400.

McCormack & Dodge 1225 Worcester Road Natick, Mass. 01760 508-655-8200

Hilitias

Alphatronix, Inc. has announced a backu utility software package for Digital Equip ment Corp. workstation users.

Rapidstore is for use with the company's Inspire series of erasable optical-storage systems. Used in conjunction with each other, the products provide activare backup operations five times faster than tape, the vendor said. DEC's VMS 4.4 through 5.0 in required for operation. The software costs \$1.900 for a DEC-Q-bas configuration and \$2.900 for a

Unibus version. Alphatronix Suite 1000 4900 Prospectus Drive Research Triangle Park, N.C. 27709

919-544-0001

REM Associates has uncoussed the re-lease of an IBM Application Systems/400, version of Rembico, the company's and instrumented documentation package.

The company of the

gible for the lowest amount the company. REM Associates P.O. Box 527 Village Station New York, N.Y. 10014 212-243-2416

Computer-aided software engineering

Passophic Systems, Inc. has associated an OS/2-based computer-sided activare engineering product designed for Pansophic Telon users. Telon/Teamwork 1.0 reportedly allows users to perform structured stallysis and design of applications by utilizing IBM's Programmable Workstation Software development statement Software development statement.

Technologies, Inc.'s multitaking/ virtual memory environment.
The product incorporates cooperative processing architecture and allows data modeling and data flow diagrams to be used for application development. The software is priced at \$6,500 per copy for quantities of two or more. Paneophic Systems 2400 Cashot Drive Lake, Ill. 60832 312-2606-2000

emputer-aided noftware engines slopment tool for multiuser pers puter-based systems has been ced by International Consulta-sies, inc.

Release 2.0 of Applaud re lows PC users to create appl tems without writing program tems without writing programming code The computer must be running MS- or PC-DOS and have a minimum of 640 bytes of memory, with 485K bytes avail able for Appland, the company said. To software includes self-documentation or publishes that analyze the design specific coinces to produce customized end-see most and the control of the control to the control of the control to the control of the control to the control of the control Normally priced at \$2.405, the product will be discounted to \$1,995 throug October.

mal Consulting





Instant Mainframe. Just Add SCO.

Not too long ago, a few dozen people sharing the same pro-grams, resources, and information on a single computer at the same time meant only one thing-a mainframe.

Powerful, big, expensive, and proprietary,

More recently, the same people could be found doing exactly the same things - simultaneously sharing programs, resources, and information - on a minicomputer.

A lot cheaper, a lot smaller, yet powerful enough to do the same jobs. And just as proprietary.

Then along came the latest generation of personal computers. And now, the same people are more and more likely to be found doing exactly the same things-simultaneously sharing programs, resources, and information - on a PC.

And not a whole officeful of PCs networked together, either, but a single PC powering the whole office at once.

A lot cheaper, a lot smaller, yet still easily powerful enough to do the same jobs. Built to non-proprietary, open system standards that allow complete freedom of choice in hardware and software. And running the industry-choice multiuser, multitasking UNIX* System V platform that gives millions of 286- and 386-based PC users mainframe power every business day.

The UNIX System standard for PCs-SCO"

Today, SCO UNIX System solutions are installed on more than one in ten of all leading 386 computers in operation worldwide. Running thousands of off-the-shelf XENIX® and UNIX System-based applications on powerful standard business systems supporting 32 or even more workstations - at an unbelievably low cost per user. And with such blazing performance that individual users believe they have the whole system to themselves.

Running electronic mail across the office-or around the worldin seconds

Running multiuser PC communications to minis and mainframes through TCP/IP and SNA networks.

And doing some things that no mainframe—or even DOS- or And doing some unings that no manufacture of the sound of DOS applications. Or networking DOS, OS/2, XENIX and UNIX Systems together. Or running UNIX System versions and workalikes of popular DOS applications such as Microsoft® Word, 1-2-3®, and dBASE III PLUS.*

Or even letting users integrate full-featured multiuser productivity packages of their choice under a standard, friendly menu interface. Today's personal computer isn't just a "PC" anymore, and you can unleash its incredible mainframe-plus power for yourself-today. lust add SCO.

The SCO family of UNIX System software solutions is available for all 80286 and 80386 based industry standard and Micro Channel" computers



(800) 626-UNIX (626-8649) EAX: (408) 458-4227

PCs & WORKSTATIONS



Patricia Keefe

Swamped with power



This is not what users want, out it is what seems to be going in today, what with the push rd faster, more expensive platforms, ever spiraling mem-ory requirements and all kinds of attendant issues. And this at a time when many information ms departments are quer or the validity of sensrate

rs touting applications that uire at least 2M bytes of require at least 2M bytes of memory beyond the 4M bytes alrendy socked up by OS/2 and the still 2M bytes more required by Presentation Manager (and don't even think of loading a second application), you've got three heavyweights — IBM, intel and Micropott — insisting that users need a 386, or at least a 2005.

It's the flu season for micros

Expected autumn virus strains breed apprehension among PC users

BY MICHAEL ALEXANDER

uses this year. The Cascade, Datacrime and at a least a few strains of Jerusalem viruses (among others) will hit PCs starting in October and continue nearly unabated until December, according to comput-

er security experts. Not surprisingly, the many

U.S. Trust seeks speed with optical system

ONSITE

BY RICHARD PASTORE

NEW YORK — Hoping to eradi-States Trust Co. has put its faith in a networked optical document

Presentation Manager Arrives For Micro Focus COBOL/2 F Programmers!

Micro Focus COBOL/2 now includes System Programming Extensions that enable the full range of Presentation Manager functionality to the COBOL programmer. Best of all, after becoming familiar with the concepts of PM programming, the COBOL/2 programmer.. Does not need to be retrained in another language in order to build PM application

Needs only learn a few simple, new extensions to the COBOL language

Can do anything that can be done in C or Assembler

Come pioneer with us and other COBOL programmers interested in exploring this exciting, new graphical user interface. Presentation Manager programming is not easy in any language, but it can be rewarding. Now the opportunity is here for all COBOL/2 programmers.

MICRO FOCUS

A Better Way of Programming" For more information about Micro Focus COBOL/2 call us at 1-800-872-6265 or 415-856-4161.



Everything OS/2 can do for you...



This offer lets you do for less.

Right now, when you choose OS/2, you can get from \$100 to \$1,600 back on the kind of heavy duty memory that only OS/2 can handle. With this offer, the more memory you buy (up to 8Mb), the bigger your rebate.

Plus you can get thousands of dollars in rebates on over 100 different OS/2 programs. You can also get hundreds of dollars back on modems, accessory cards and hardware—all the things that help you do more work in less time with OS/2.

So if you're ready to move up to all the real advantages of OS/2, ask your IBM Authorized Dealer about these rebates today. To find the dealer nearest you call 1 800 IBM-2468, ext 128.

IBM

PRODUCT REVIEWS

able...
The built-in 9- by- 6.7-in. gan-plasma display: supports high-resolution VGA graphics and op-erates in IBM's Enhanced Graphics Adapter (EGA) and Color Graphics Adapter (CGA) modes as well. The same display

monitor.

The T5200 comes with MS-DOS Version 3.3, utilities designed for setting the system configuration and display modes, Quarterecke Office Systems, Inc.'s QEMM-386 expanded

Toshiba T5200: A speedy laptop

Features high-quality display resolution and expandability



isplay and complete hephorar The gas-plasma display in par-cularly readable, although it is no not provide flexibility in notrol of color emulation. The bid gray case includes a fold-ich 1.56 in. deep and 3.9 in. sick. The keybourd is one of the not complete on any luptop and chudes a separate emuseric key-ses weight — succept to the second of the color of the or weight — succept 20 pounds. The TS200 includes an Intel orn, 80385 processor that russ

shibs TS200 is unparalong taytop and portable Memory may be expanded to a raw when it comes to total of 8M bytes. All memory above 640K can be configured as extended or as Lotos/(Intel)

2.0 is a graphic-tested tax-ne-bata analysis program. Unlike its predecessor Refiex 1.1, the new version does not load all its data nto memory. It can handle up to 85,000 records or 32M bytes, whichever comes first.

Brightbill-Roberts' Hyperpad for hypertext



Reflex upgraded, but not enough

Hyperpad CONTINUED FROM PAGE 41

Reflex CONTINUED FROM PAGE AL

multifile lookup functions. It does offer a few functions that allow lookup of data from the previous record, first record in a group or last record in a group when

group or last record in a group when printing areport.

To perform a guery in Reflex, a user must bring up a list of data fields and enter the appropriate formulas in an adjacent column. "O" conditions are placed in an additional series of columns, and "and" conditions are placed in the assert column. The open columns are column. The open columns as a filter, which will affect all subsequent as a filter, which will affect all subsequent graph views, cross-tabs and reports. Re-flex will automatically update the data-

base, based on manipulations of the fil-tered data.

Reflex allows sorting of data for up to five fields simultaneously, with each field individually ordered in ascending or detree heids simultaneously, with each need individually ordered in according or de-scending order. It automatically imports or exports Reflex, Version 1.1 files. Oth-er file import and export types include Dbase, DIF, 1-2-3 Versions 1A and 2, Quattro, Paradox, Symphony, PPS and ASCIT.

ASCII.

The Reflex documentation offers excellent indexes and a short DOS tutorial. In place of an on-line tutorial there is a comprehensive tutorial massial.

Since Reflex is consistent in operation

om view to view, it will be a one-ste learning process for most people. 1-2-3 users will have it even easier.

However, there are some problems. Reflex is awkward to use with a mouse. Also, the asynchronous disk I/O feature can cause problems with data files when Reflex is run in anything but a strictly sim-

Version 1.1, it is still lacking in many key areas. Despite its shortcomings, Reflex, priced at \$249.95, can be one of the best analytical tools for users who have been trying to make Lotus 1-2-3 work like a flat-flie database.

has an Undo command, but it can-store an accidentally deleted but-dividual pads are assigned one of vels of protection, ranging from ag mode, which does not allow a, to acripting mode, which pro-

Hyperpad'a current implementation to a few rough spots, and its overall une-ness remains up in the air, but with a re-lprice of \$99.95, it is a clever idea ced for the masses. Its ultimate suc-sic depends in large part on the exis-sic of third-party pads. None are avail-



Spreadsheet duel for user loyalty heats up

BY PATRICIA KEEFE

Users caught in the cross fire of the spreadsheet war waged by Microsoft Corp. and Lotus Development Corp. should find themselves peppered with considerable savings — if they haven't

yet — from an ongoing battle of one-up-manship in promotional strategy.

Microsoft winds up a yearlong promo-tion on Excel for Windows later this

month that it claims boosted Exce's mar-icet share from 10% to almost 15%. Microsoft may be referring to total Ex-cel sales — including the Apple Comput-

er, Joz. Macirioth narhet — ber figures from international libat Corp., a market research firm based in Framingham. Mans, pur P. Excelsale closer to 9th. A Lotus spickerworms shot dispatch officers of the control of

ness unit. "We believe people were waiting for Release 30 to make a final decision the second second

will result a Ashan-Take Long 3 a Financian Haber Dakage.
Lotas were on the deficient for 3 line, the state of the control of

or are on networks. Presince Plan 3.01 requires 438K bytes of free memory after DOS is loaded, compared with the 508K bytes of memory region of memory region of the 508K bytes of memory region of the plan bytes of memory requirements can be further reduced to 415K bytes, Lettuc climnod. It costs \$495; registered users of Freelance 3.0 can upgrade for \$200.

Memorable Ministry

registered under a reasonal tass disconsistent and management and



CONTINUED FROM PAGE 41 nt of time as with a desktop i

chine. Adding memory or a numeric co processor is relatively easy. Initial setu could be essier if the hard disk came pre

The speed, display, keyboard qualit and flexibility of the T5200 make it a jo to use. The on-line help is top-notch, an it addresses hardware and software prob

lems.

The T5200's case is sturdy, and a components are well shielded. Intern layout is clean. Although the display him is solid, its cover did not fit quite flash, as there was no cover for the connectors.

there was no cover for the connectors in back of the machine.

The TS200 comes with a one-year warranty that includes next-day turn-around on repairs. Technical support available through a toll-free number.

The laptop lists for \$7,099 with a 60M-tyre hard disk and 2M bytes of RAM. It is in line with prices of other 386 portables but is considerably more expensive; than 20-MHz 386-based desktops and 286-based between 20-MHz 386-based desktops are of 286-based between 20-MHz 386-based desktops

before he bought PCs.



When he got his first job on Wall Street. Tom's HP calculator was Street, Tom's HP calculator was his most valued possession. It was the combination of innovation and reliability that gave him an edge. So when his information Systems Manager recommended they go with Hewlett-Packard personal computers, Tom needed

to 8 accessory
to 8 accessory
slots, 620 Mbytes of hard disk
storage, and 16 Mbytes of RAM.
And all models accept both 5.25"
and 3.5" disks.

industry standards ensures com-natibility. Now and into the future

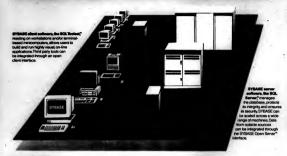
But the most important feature is one that Heylett. Packard has offered for 50 years. Exceptional quality This, along with HPs extensive network of trained, authorized dealers, gives you all the assurance you need. For the dealer nearest you, call 1-800-752-0900, Ext. 282.I.

There is a better way.



PACKARD

SYBASE Client/Server Architecture...



Increases Your Competitive Edge

Your on-line, mission critical applications manage real-time information to cut costs and improve efficiency, SYBASE is the first SQL-based relational database management system (RDBMS) built to handle these demanding applications. Only SYBASE client/barver architecture, with its programmable server delivers:

Scalable High Performance for dozens to hundreds of users updating and querying large databases.

Server Enforced Integrity for improved control and maintainability of critical information. High Application Availability thanks

High Application Availability thanks to on-line maintenance and softwarehased fault interance.

based fault tolerance.

Open Distributed DSMS to transparently integrate heterogeneous hardware and software systems.

Window-Based Tools for increased productivity with powerful, graphical,

Delivers Enterprise-Wide Benefits

SYEASE gives information managers hardware independence, including a transparent migration path from hostbased applications to the workstation and distributed computing technologies of the 1990s.

SYBASE gives developers faster development cycles, simplified application maintainability, and greater application reliability, because integrity and business rules are centralized in the programmable server.

SYBASE gives end users powerful decision support tools and a graphical application interface that's intuitively easy to use.

SYBASE*

On a Variety of Powerful Platforms

Ask about SYBASE for VAX/VMS, Sun/UNIX, Stratus/VOS, Pyramid/UNIX, OS/2, PC/DOS, HIP/UX, IBM RT/AIX, NeXT/Mach, VAX/UNIX Sys V, AT&T/UNIX, Apollo/UNIX, and Macintosh HyperCard.

Microsoft and Ashton-Tale selected SYBASE for the OS/2-based SOL Server. NeXT and Stratus selected SYBASE to be shipped with every computer system. And hundreds of companies in financial services, telecommunications, manufacturing and government/defense have chosen SYBASE.

Find out how SYBASE can effectively manage your on-line applications. Use the coupon below or cell 1-800-447-9227 about a free SYBASE seminer.

object-oriented tools.	grapriical,	6475	Christie	Ave., Emeryville, CA	94606				
Register me for serninar ii on (date)	SYNAGE From Sonatur Schoole 1-800-447-0227 All sonature ran 6 am to ston.	0 1 Les Aspetes 0 2 Chicago 0 2 Chicago 0 3 Chrosted 0 6 Montreal 0 8 Westernal 0 7 Sen Chicago 0 8 Westernal 0 8 Westernal	09/12 09/12 09/12 09/13 09/13 09/14 09/16 09/16 09/20	610 Dafae 611 Sus Francisco GCTGMM 612 Danser 614 Bandle 615 Pandarur 616 Komma Clip, MC 617 Judio, KJ 616 Sus Jose 616 Bandles 617 Bandles 618 Roman Clip, MC	09/21 09/21 10/08 10/08 10/08 10/08 10/06 10/00 10/10	016 Hortland 000 Territo 017 Pillatory 022 May York City 022 Miller York City 023 Et Lords MO 001 Ether York 001 Tiller 007 City 001 Alexandro 001 Alexandro	10/11 0 10/11 0 10/15 1 10/26 0 10/26 0 10/26 0 11/21 1 11/21 1 11/21 1 11/21 1 11/21 1	100 Minrospolio 101 Orango Osanig G 102 New York City 100 Phoenix 104 Besten 105 Debtet 107 Calgary 108 Minister 108 Minister 108 Minister 108 Minister 108 Minister 108 Minister 108 Minister 108 Minister 109 Minis	11/07 A 11/08 11/08 11/08 11/08 11/08 11/08 11/08 11/08 11/08

Workstation vendors face tough sell

TEMPE, Ariz. — Although workstation makers would have you believe that they will be received like reigning royalty when they attempt to move into the comhen they attempt to move into the com-ercial sector, it sin't necessarily so. Ac-reting to a report prepared by The Sier-Group, inc., the crossover strategy of out workstation vendors is so full of sles that it looks like aged Swiss cheese. "The workstation market is much

more narrow and fragile than it appears on the surface "reads the report, which is

based on interviews with 835 companies.

"Nothing looks right here. The cost of wart fleshbility, and many are just not entry is extraordinarily high. So high, in ready to make the concessions a switch-fact, that Sun may be the only pure work-over will require," he said.

port said.

While the performance of worksta-tions has made them hot in the ocientific and technical community, they have yet to make significant inroads among per-sonal computer users in the locrative commercial sector.

Won't woit to play
Hammons said PC users want plug-andplay use of new software packages and do
not want to wait for them to be ported to
heir, workstation wendor's platform. Although PC applications can run on workstations using software or hardware coprocessors, it is native-mode application
that will make all the difference, Hamthat will make all the difference, Ham-

Revelation plans get mixed review

BY RICHARD PASTORE

Users interviewed last week hailed the embedded SQL and database server accessibility promised for the upcoming release of Revelation Technologies, Inc. is database management system. But these and other features will also add several atthous to the murrly depth of mucionality that some users complain is already over their heads.

are that could use companie a stream Advanced Revisition Vernion 2.0, a stard for formal associaments and ship-and marginate files from Microsott Copy. 18 CM, Server and other database. The IBM Personal Computer-compati-tion of the Copy. 18 CM, Server and other database. The IBM Personal Computer-compati-tion of the Copy. 18 CM, 18 CM,

remain intact and accessible to other front-end applications.

Users of older product versions were interested in the new features. However, there is already "so much to the product, it's hard to find the features you want to use," said Bill Webber, a health physicist at the National Institute of Standards and

at the National Institute of Standards and Technology.

Mark Bolgiano, information systems manager at the Greater Washington Board of Trade, agreed, adding, "A Revi-ation user's first day is held because there's so much to understand. But the rest of your life is helven because you Revelution is aware of users' concerns and is addressing them by increasing the

and is addressing them by increasing the use of examples in 2.0's documentation and restructuring the manual's organiza-tion, said Richard MackSoud, director of

tion, said Richard MacKoud, director of technical marketing. Release 2.0 will require 640K bytes of random-access memory and a hard disk. The release can accommodate up to 4M bytes of expanded system memory and requires OS/2 or DOS 3.1 or higher. The company will amonute prizing in November. It is expected to be equired to to Version 1.1 2 parise of \$950 for a fall de-

Teach your HP LaserJet Series IT the powerful PostScript language. In one easy

PACIFICPAGE

the PostScript*Language Compatible Plug-in Cartridge

with IBM® and IBM-compatibles.

PacificPage is the result of the proven cartridge-based technology-Platter in a Cartridge**, 25 Cartridge in the Decific Data Products and the innovative PoetScript emulation skills of Phoenix Technologies, Ltd.

Now, you can turn your HP Laserderies II into a PostScript language compate printer simply by plugging in Pacific tat Products PacificPage cartridge. oles are required.

Immediately start printing PostSci guage output from Ventura Publish has PageMaker®, WordPerfect 5.0%, crosoft Word® as well as many other sphice and business application soft-ckages. And PocificPage is competible

PACIFIC

ADD Flows; being to , Sur Deage, CA 50121-0010502-0800-file 8215052-2800-file-to-Page, 25 Carvegor in Otal, and Plotte in a Connego are trademark.

Friends Disk Physiolis, No. Produced in impostance trademark of dope between the Physiologic is in applicated beginned in Physiologic III.

Joseph L. M. 2004 Process Sectionage, and if after impostance programmed and trademark trademark.



Gates on the stump to boost OS/2

Y ELLIS BOOKER

CHICAGO — It's become a regular routine for Microsoft Corp.'s Bill Gates: extolling the advantages of OS/2 while anovering my-sayers in the crowd. At the Computer Association

for Microcomputer Professionals Conference (CAMP) two weeks ago, the Microsoft chairman and chief essecutive officer responded, as requested, to prepaired statience questions about the future of OS/2 and its relationship to Microsoft Windows ments and predictions to the 1,100 CAMP attendees were the following:

• One million copies of OS/2 will be sold during 1990, compared with 10 million copies of DOS.

• Of all personal computers, and 12% now run Windows, and this Oumbre will rise dramatically and the computers.

Ashed shout a future relationship for OS/2 and Unix, Gates put off the prospect. "It's possible," be said, "that as you move to more advanced things— like to object orientation — Unix will too move quite as quickly fas so OS/2!" He added that the "committee decision-ornoress" for the

ifferent Unix varieties may also slow its market acceptance. Also, Gutes did not encourage

Also, Gates did not encourage speculation that OS/2 would be ported to other architectures: "We're not going to have source codes in Egghead (Discount Software) stores where administrative assistants are re-compling source codes and editing printer drivers for different systems."

clarified Gates' remarks has week by explaining that Micro act had described plans for a portable version of OS/2 at it systems activare seminar in February but has not indicated dates or what it would be for.

CAMP attendees also got a peek at OS/2 Version 1.2 for In tal. Com. 80286-based mass.

peek at OS/2 Version 1.2 for Intel Corp. 80286-based machines. Notable changes that Gates demonstrated include a somewhat different graphical user interface; a reduction in the program's memory overhead requirement and an increase of 40K bytes, to more than 520K bytes, allotted to applications rustning in an OS/2 "compatibality box."

U.S. Trust

write-once read-many cartridges storing as much as 150G bytes of data. The units are linked via Banyan Systems, Inc.'s Virtual Networking Software, or Vines.

ware, ov viscs.

The system has been in pilo plase at the company's midtown Manhattan headquatters fo more than a year. In mid-October, according to Aisenberg U.S. Trust will be ready to implement the full complement of 140 retrieval stations and link its remote locations in Palm Beach File., Dallas and Los Angeler come leasand lines.

The firm has already been able to cut the number of employees needed to manage documents in the trust department from 17 to five, Aisenbrey said.

Companywide, the system is expected to eliminate the nees to provide on-aite storage specifor paper documents — a cost condition in Manhattan. Backun documents will be stashed in swarehouse located on less expensive New Jersey real estate.

The company expects pay

The company exp back on the full system or 1993, Aisenbrey said As with most new

opes, there were several stack situations to solve, Aisenbresaid. "Most of the problems related to identifying and putting together an appropriate network and laying it out so the traffic congestion could be kep at a minimum."

The company eventually uses

> mainframe so that ho data could be download by to optical disc.

Input Copy And Graphics
Into Your Computer—Instantly—
Without Using The Keyboard.
Then Use Your Computer As A
Full-Featured FAX To Transmit
Documents Instantly.



All For Under \$1,000!

Chinesh new azamens could change ferrore the very consensation from the same test with COX otherway so can input test without relepting it. With a nimple add in our charm your comparer to a fulf-factured fax. And 105-2000 and 2000 will scan almost 105-2000 and 2000 will reflected resolution levels so there is a minor that it sight level replication—and you be taken that it sight level replication and so the could be so the consensation and the could be so that the could be so that

Toll-Free (800) 441-4222 • In CA (213) 533-4274 • Fac: (213) 53
Chinon America, Inc.
GEN Mayle Average
CHINON



DS-2000 And 3000: The Affordable Scanners From Chinon

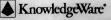
COMPUTERWORLD



Due to software errors in the reservation system, some seats wear out faster than others.

This airline had to develop its reservation system the old-fashioned way. If you want your company's software to deliver the desired results, it's time you talked to follow the desired results, it's time you talked to KnowledgeWare. We're the new leader in Computer Aided Software Engineering tools and technologies. And ouit tools will stay on top, because nobody is closer to IBM's vision for application development than we are.

Call 1-800-338-4130, Ext. 100 (in Georgia call 404-231-8575). KnowledgeWare, Inc., 3340 Peachtree Road N.E., Atlanta, GA 30326.



. The World's Most Comprehensive CASE Tool Set

New Wave combines best of DOS, Macintosh, users say

ANALYSIS BY JEAN S. BOZMAN

CUPERTINO, Calif. - In Hewlett-Pack-

Quite possibly, industry analysts and rly users are saying. The product may idge the cultural gap between the look of feel of the IBM Personal Computer's

DOS applications and Apple Computer, Inc.'s Maciatonh environment. On its PC-compatible side, New Wave can "wrap around" many standard DOS applications such as Lottue Development Corp.'s 12-3 and Microsoft Corp.'s Excel any Windows-compliant application can be imported to it, said Webb McKinney, general manager of HP's Information Systems Division in Santa Clara, Calif, An

on-board Help menu assists New Wave users in porting over DOS applications that run under Windows. This "encapsulation" process allows

users to move PC spreadsheets arou their New Wave desktop with the mou their New Weve dealtop with the mouse and icon interface more familiar to Mac uners. Unlike the Mac interface, New Weve objects can be drugged by a mouse and directly integrated into a second application, similar to the X Window System environment. The Mac interface uses a cityboard device to accomplish the same action in two teeps by cutting and pasting. The similarity between the two envi-ronments, while generic provised Apple in the contraction of the contraction of the con-traction of the contraction of the con-tr Early users said that New Wave's ob-

ject-oriented memory manager break new ground. The way New Wave store all objects as unique elements in a central database allows New Wave users to share these objects, such as graphs or reports, between applications. When any object, such as a spreadsheet, is changed, the new numbers are automatically updated,

Hor-linking
"It's really pretty nest," said Red Morgan, staff manager for systems and information technology support at US West in Phoenic. "New Wave is the next step beyond Microsoft Windows and the Mac enthe concept of hot-linking data across apations that is the magic in New

Wave." Morgan, who has been troubl morgan, who has been trousesmoot-ing New Wave for several months as a beta-test user, is building an executive-support system on New Wave because of

"You're not working specifically with an application," Morgan said. "You're working with data that is independent of worang with the last is more pendent of the application program that's manipulating it." Morgan's prototype executive system combines word processing, a spreadshed and a graphics package under New Wave.

it the edge on competing products, some

it the edge on competing products, some nashyris said.
"There's nothing side out there to compete with New Wave right now." said John McGarthy, director of professional Cambridge, Mans, and a New Wave user. "The Mac's been out there for fire years, wittailly unchanged, and the closest thing to New Wave is offered by Next. And that 'a late in shipping." The Mac's System 7.0 operating system, do next year, largospical to compete with New Wave is accepted to Compete with New Wave is accepted to Compete with New Wave is

One flaw in the first release of New Wave — now available only from HP's sales force — is its lack of a robust agent sales force — is its nex or a roways agent facility [CW, Sept. 4]. The "agent" repre-sented on-acreen by a blande-haired fel-low in sunglasses is supposed to function as the user's personal assistant. It will be as the user's personal assistant. It will be able to mimic is user's keyboard and mouse actions for later repetition—or-chring the downloading of 8 file overnight, for example. For now, the agent follows only actipted discretions, IPF and in the trailed audit New Wave's second re-tablels until New Wave's second re-tablels until New Wave's second re-tablels and New Wave product assunger 1990, said New Wave product assunger Sever Gere. That is about the time when

1990, said New Wave product manager Steve Grey. That is about the time when users should be able to find New Wave in their nearby computer-retail outlets. Un-til Movember or December, users will have to call HP to place an order, HP said. HP intends to sell New Wave as an independent product, free of any tie to stan-dard HP product lines. In this respect, it will be like the HP Laserjet printer, ana-lysts said. But there may be a tie-in for in-

rmation systems purchasers, McKin mey said.
"We've written New Wave's Mail package to connect to the HP 3000," be said. "Our goal is to have portable applications that can be used across our product line, including our Unix-based systems." That way, be explained, HP can leverage any gains made on the New Wave deaktop.

Announcing a Unique Senior Data Processing Management Event.

INTERNATIONAL EXECUTIVE MANAGEMENT SYMPOSIUM ON INFORMATION SYSTEMS

October 22 - 25, 1989

The Burlington Marriott Burlington, Massachusetts

Notable Pioneers and Prominent Experts in CASE Technology will present three interactive executive level seminars on major issues concerning you, the Senior Data Processing Manager:

Caring for Existing Information Systems -Monday, October 23, 1989

tion by: William Hoffman, Price Waterhouse

Introduction 19; william Hoffman, Frice waterinouse
Your Educators: Joel Goldhammer, Ernst & Young, William Ulrich, XA Systems Corporation;
Steve Errico, Errico Technologies, Inc.; and Scott Berlinger, Coopers & Lybrand.

Creating an Environment for Building New Systems -Tuesday, October 24, 1989

Introduction by: Dr. Doug Ingram, Life Cycle Technology. Inc Your Educators: Fred Thorne, Deloite Haskins + Sells: Steve Perkins, Booz,
Allen & Hamilton; Tom McCabe, McCabe & Associates, Inc.; Dr. Doug Ingram, Life Cycle Technology, Inc.; and Paul Radding, CASE Technology Group

> Preparing Your Organization for CASE Technology -Wednesday, October 25, 1989

Introduction by: Al Case, Nastee Corporation Your Educators: Barbara Bouldin, Bouldin, Inc.; Dave Sharon, CASE Technology Group; and Paul Radding, CASE Technology Group.

Join us, our distinguished speakers, and an audience of your peers for this unique Executive Information Management Symposium.

Please call for additional information on:

- Symposium registration; (617) 696-0427 or (508) 668-6543 - Participating in the Vendor Reception: (503) 656-0986

- Purchasing a copy of the Symposium Proceedings: (617) 696-0427 or (508) 668-6543

Presented by:



Evolving Technologies Corporation 7 Lafayette Drive East Walpole, Massachusetts 02032

Educators in Evolving Technologies

Keefe CONTINUED FROM PAGE 39

CONTINUED FROM MOCE 29

Uses and border has religing required, amounted of demonstrated, depthe resultance of demonstrated, depthe resultance of demonstrated, depthe resultance of the religion of the religi

Don't mess up a good thing. While the future struggles clumsily to get off its feet, I'll wager that many users are per-fectly happy with their trusty line! 80286 and even 8088 personal computers, which may or may not be attached to a 386-based file server.

A user such as Leeland Hutchinson, a surtner at the Chicago law firm of Free-orn & Petera, isn't necessarily looking

Computer flu

CONTROLED FROM FACE 20 consideration are survivous programs such as "succious." which attempt to identify whome about they indeed programs and the survivous programs and an investment of the survivous programs and eliminate view code. Both offer control of the survivous and eliminate view code. Both offer control of the survivous and eliminate view code. Both offer control of the survivous and survivous a

to turbocharge his shop. More realistically, he weaks a gradual growth path for the control of t

or open a trade rag, you find yourself back to be very uncertain flater, and appeared for the product, more industry support for the product, more industry triping to despuis its 28th pilotters and trade of the control Chairman Bid Greate was quoted to control Chairman Bid Greate was quoted whether that is because Morrounds reserved whether that is because Morrounds reserved whether that is because Morrounds reserved and the control of t

self-cerving to me. But users may get the last langk. While versions strangle to move presentance of the first lost text because the control of the control

ele is a Computerworld senior editor, PCs and

The word on the street about UNIX is Unisys.

The UNIX' computer operating system lets customers deeler nal solutions free of technical

Unlays committed early on to providing the

become a formidable

as quoted in Computerworld

We're achieving that goal, but

our word fer it... With a focus

like ours, it's no der Unisys cial UNIX

suct breadth and software depth, and we are doing it now. Not talking

Call 1-800-547-8362, and get the MISSYS AND YOU

The power of *

those who've seen the systems...are among

UNISYS

D 1986 Urane Corporation. Urane is a registered traderrark of Urane Corporation.

PRODUCTS NEW

whenever a transaction is accord or edited, all relevant files are automatically adjusted. Any rec-ord may be altered at any time, and the system reportedly pro-vides a variety of reports. Each

Reseda, Cam. 1

Prime Computer, Inc. announced that it has upgraded its mieras Version 3.2 of Personal Initial Graphics Exchange Specifica-

uckage was d

£1 300 Prime Prime Park Natick, Mass. 0 508-655-8000 01760

Software utilities

Vericomp has announced a soft-ware product reportedly de-signed to ease the DOS 640Kbyte memory constraint in the IBM Personal Computer, AT, Personal System/2 and computi-

Memory Master is said to provide four different methods of increasing the amount of wallable conventional memory, the dependent on the user's hardware configuration and applications being user. The actives retain a far the memory of the produced of the configuration and applications of the configuration and applications being user. The produced of the configuration and the configuration and the configuration of the configuration of the configuration and the configuration of the configura

Athens Software has announced a utility program for organizing and reclaiming hard-lisk space for IBM Personal Computer, AT and compatible users. Disc Director reportedly elaminates wasted space by finding unused duplicate files, empty and insertice interest directories and orphan files.

files.

According to the company, the menu-driven program helps users logically reorganize tree structures and permits them to attach 78-character comments to directories, files and driversion 2.0 or higher and 512K bytes of random-scores memory. The price is 379, with site licenses available.

censes available.
Athena Software
663 West Aspen Way
Louisville, Colo. 80027
303-666-9569

Worlawie Software, Inc. has introduced a software package introduced a software package and the reporteding protects person-computer virus activity before computer virus activity before manages door. A breake 30 of the Personal Wershes 30 of the Personal Virus and the Personal Virus and the Personal Virus and the Personal Virus and the Virus and Vi testing of new software.
The price is \$99.95, and

The price is \$99.95, a upgrade program is available Worldwide Software 15th Floor 40 Exchange Place New York, N.Y. 10005 212-422-4100

NETWORKING



Reuce Richardson

Three steps to integration

ration. The goal is to seam-ly combine applications and a for a single-system view of

nt operations. Ideally, the mechanics of the egration are hidden from the er, who has no real need to

Our studies at Advanced Manufacturing Research (AMR) show there will be three stages in the evolution of integrated in-formation systems. The stages are based on satisfying a hierar-chy of information needs. Stage One involves defining the advanced application envi-ronment (AAE), a set of guide-line of the control of the control of the control (AAE), a set of guide-

e, an application program-ng interface (API), DBMS Continued on page 59

Networld draws LANs together

Focus is on companywide connectivity, smarter bridges, Token-Rings

BY CHARLES VON SIMSON and ELISABETH HORWITT

y committed the product in-ductions at last week's tworld '89 conference, re-ting users' increasing de-nd for tools to integrate their lated LAN installations into a ueu s.A.M installations in ble corporatewide netw

ng system.

The major artillery displayed at the show included more intelligent bridges, Token-Ring interconnectivity and faster

oughput.
"We see a lot of der the Fortune 1,000 for wide-area connectivity," said Mary Mo-dahl, network analyst at Forres-ter Research, Inc. in Cambridge,

issa. "But these large compa-es are moving toward the ro-set functionality of routers, here is a large difference in the ophistication of the technology, and a number of vendors will not

RAD Data Cor

Bridges and routers on the rise their LAN-based saem

	Volue of U.S. slipments in infliens								
	1988	1080	Talent	1991	1992	1993			
Local bridges	\$32	\$46.6	\$62.2	\$79.5	\$100.7	\$126.9			
Remote bridge .	846.3	967.5	\$101.1	\$159.9	\$237.1	\$331.9			
Routers	\$48	\$67.2	\$96.6	\$147.8	\$235.4	\$402.2			
farten.u.s	\$46	\$62.1	\$86.3	\$127.1	\$220.9	\$407.7			
futal	\$172.3	\$243.4	\$346.2	\$514.4	\$794.1	\$1,268.7			

quired by the U.S. Depart-ent of Defense. . The AS/400's TCP/IP, which The AS/400's TCP/IP, which IBM said will be available next March, permits an AS/400 to communicate with other systems running TCP/IP over either a 4M bit/sec. IBM Token-Ring network, Ethernet Version 2 or IEEE 802.3 LANs.

At its announcement, IBM demonstrated the potential of a TCP/IP link, connecting workstations from Hewlett-Packard stations from Hewlett-Packard Co.'s Apollo division and Sun Mi-crosystems, Inc. to an AS/400 over an IBM Token-Ring net-

ver, to con However, to complete : TCP/IP connection, the Token

Netronix, Inc. in Petaluma, Calif., announced Ethermaster 13000 Bridge, which is said to provide throughput of up to Continued on page 58

loyle. "They've said the ave Ethernet for a wh aid, adding that native E in the AS/400 would obv-sed for the LAN bridge analysis of the bridge continued, is that "any!

TCP/IP: A hint of IBM multivendor connections

BY ELLIS BOOKER

WHITE PLAINS, N.Y. - IBM's recent addition of Transmission Control Protocol/Internet Procontrol Protocol themse Pro-tocol support in the Application System/400's operating system may be an acknowledgment that its year-old midrange processor may be used in many non-IBM

dard Open System Interconnec-tion [products], TCP/IP is the ommon communications d." said Lee Dovle, manstandard," said Lee Doyle, man-ager of local-nee network re-search at International Data Corp. in Framingham, Mass. Doyle noted that Digital Equipment Corp. VAKs, many Unix workstations and personal computers speak some brand of TCP/IP and that this is the

networking protocol currently

400 Page-Per-Minute Performance on DECNet, Token-Ring or other LANS

Spur PAGE PRINTER CONTROLLER (PPC) Introducing the high-performance page printer controller

network. The PPC supports printers up to 400 pages per minutel LAN Connectivity to DECNet, Token-Ring, Ethernet and others

 Print Job Queing - Unattended Operation or Remote Operator Control Custom FCB & UCSB Loads

Custom Translation Tables

 On-Screen Menu-Driven Applications Software included Quality High-Performance Printer Interfaces Since 1972.



SPUR PRODUCTS CORP. 1222 EAST GRAND AVENUE

EL SEGUNDO, CA 90245

TEL: (213) 322-0012 FAX: (213) 322-1454





CODEX OFFERS NETWORK SOLUTIONS OTHER VENDORS CAN'T.

It's not unusual for our customers to be pleasantly surprised.

Because at Codex we often suggest network solutions other vendors don't.

We can do this because we aren't limited to any one networking technology. So we're free to recommend the best solutions based on your business, apolications and bandwidth requirements.

WE'VE GOT MORE EXPERIENCE, WITH MORE TECHNOLOGIES.

No matter what your applications call for, we have the right mix of products and services. Including T1, X.25, stat muxes and other analog and digital transmission devices. Plus network management systems that actually predict and help solve problems, instead of just reacting to them.

Along with customized solutions, you benefit from our 27 years of networking leadership, innovation and unsurpassed reliability. In the U.S. and 44 countries worldwide.

So the next time you have a problem or a networking question, give us a call at 1-800-426-1212 ext. 7231.

And we'll examine the possibilities like nobody else can.



DYESE ETHAT"

Racal-Milgo net strategy seeks its own levels

system announced late last month for the vendor's Omni-mux 8000 networking T1 multi-plexers, signified that virtually

The goal of the strategy is to first provide users with integrat-ed management of all Racal-Milgo products from a single

work management standard to solidify, Racal-Milgo is support-ing the two de facto standards; IBM's Netview — with an exist-

Thile waiting for the OSI net-

ing interface — and AT&T's Unified Network Management

Unified Network Management Architecture — with a planned interface. However, Racal-Migo sees Netwiew as the best way to piggyback OSI status, Corr sid.

The route the company is taking is a wise cost, according to local properties of the company is offering a top-down strategy for compatibility, code strategy for compatibility, code and consolidating it into one cohesive arrangement.

© Lastman Kodali Company 1989

The KODAK Optical Disk System 6800... for people with a lot to store, and not much time to process it. The system has the highest capacity and the highest transfer and access rates. If your business needs to store and retrieve significant amounts of image-intensive or alphanumeric data,

specify the KODAK Optical Disk System 6800, to offers unparalleled storage capacity, flexibility and speed, in the smallest footprint per and speed, in the smallest loogithic per megabyte available today. The KODAK Automated Disk Library can put you on-line to over one terabyte—that's 1000 gigabytes
—of stored data in just 6.5 seconds.
Available in several configurations, the library requires as little as 13 square feet of floor space.

Additionally, the KODAK Optical Storage interface can connect the system to a wide range of minicomputers or IBM® mainframe host environments. For a complete package of

information, call 1800 445-6325, Ext. 993B.

Four eyes
Last year's Multilink 4 announcement provided a fundamental level of integration, allowing users to view four Digital metrial were of mergerison, ne-gramment of the property of th

dor's CMS 2000 network man-agement system. It also integrates the alarm and alert functions of the Omnimux 8000, CMS 2000 and CMS System Performance Analyser with a

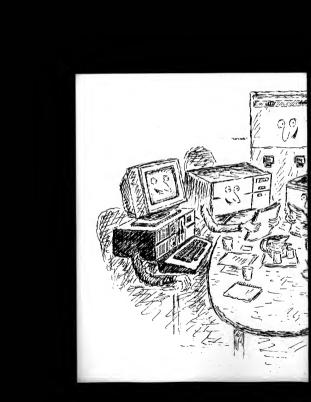
common their presentations, concontrol to exprine modifiers or
windowing for sharms and alerts. Additional sharm integration
configured with Release 2.0 of
Earth-Magin Colley with integration
face to Neview. The system
face to the system
face

pleasers and com-work management systems. The firm plans to develop management systems for its disl-up modems, command structure and database integration, as well

We Speak The Anguage Of Business.



MEMOREX TELEX





We Speak Your LANguage stand you and we'll underWe Speak Your LANguage stand you and we'll
ANGUAGE of there and Taken Ring LANs. for
2270 networks, for midrange systems, for large
storage systems and even the
most exotic airline
reservation systems.

We're the people of Memorex Telex, the world's largest supplier of plug-compatible computer products, accessories, service and support.

For starters, we engi-

virtually any product you could need.

Systems Engineers then design and inte(f) grade custom solutions for your business.

Our Novell'extilfied instructions train users for fast, paintess startup. We're there from installation day to maintenance day and every other day you need us.

Speaking of needing us, our Technical Assistance Center offers you remote data acquisition by phone. And if they can't fix it, our 1300 Customer Engineers are based at 260 strategic U.S. sites, ready for 24-hour/7-day dispatch to your door.

Which wraps up a full-service package only a \$2 billion company can talk about ... in your language.

So let's talk.

WORKSTATION

70-40 INTELLIGENT WORKSTATION

Intelligent Systems Series

The 70-55 Intelligents Workstation gives you fail decktop capacity in a smaller package. We integrated wideo support and diskette control in the base system to give you six expansion sloss for a full range of communications or other options. Standard I Mad GRAM and 80:260 operation at 872-814 to 96 I GMHz. The COMPT and POSS offers 10-144 in the COMPT and COMPT an

Powerful performance perfect for the most demanding LIN server and high-end multi-user applications. The 20MHz 7070 Network Server delivers up to 16MB of KM with the available storage bays for total flexibility. Effortiessly supports leading network operating systems and can platform complex CADCAMCAE programs. A low-profile but highly-integrated A low-profile but highly-integrated BCOSE-based warkstatter. The TMO'S bulli-in functionality leads competitors with integrated video and floggy disk support. SCSI fixed-strive interface and a mouse port. Settletable ST254fff and three expansion slots make this compact performer readily expansional and adaptable for a survivo annotation and analysis of the support of the survivos of the surv

Arcnet

The Memorex Telex Intelligent Systems Series gives you a single source for a complete line of state-of-the-art workstations.

Token Ring I ANS alones. With full connectivity for 3270 and midrange systems. For although travel applications. Memorex Telex integrates ALC solutions and customizes them to meet end-user requirements.

> We've selected our most reliable plug compatibles. Then increased performance, streamlined profiles and integrated functions, and expanded flexibility to offer you unmatched versatility in systems solutions.

Then you get added value on top of this added value. With expert consultation, design, installation, user training and customized support. All of which makes Memorex Telex the hardware systems integrator you need to speak your LANguage.

The industry standard for packing big 12MHs performance in a small fool-print. An excellent solution for both LAN or standation applications, the 7025 Intelligent Workstation also features integrated disk and video controllers, providing two expansion slots for add-in adapter boards.



3361/BIT TAPE SUBSYSTEM

CARTRIDGE SUBSYSTEM

1224 PRINTER SERIES

1197-C2 COLOR DISPLAY STATION

DISPLAY STATION

An ergonomic and highly functional display available with green, amber or black-on-white 15" monitor, the 187-D/W2 Display Station is capable of 3,650-character display and split-screen mode. Supports up to three concurrent sessions (two displays and one printer) and 83-, 102-or 122-key keyboards. Features print trim, host-addressable printing and support of twisted pair or twinaxial cabling

The 1224 series of intelligent 4224-compatible desktop matrix printers utilizes the advanced funcprinters utuues the advanced func-tions of IPDS support such as graphs and barcodes. 256K or 512K memory. Handles 250 or 400 cps in one, four or light colors and offers versatile paper-handling capabilities.

Offering brilliant, two- or sevencolor display modes, the 1197-C2
Color Display Station supports up to
three concurrent sessions it wo display and one printer) and four terminal modes. Use with 83-, 102- or 122-key keyboards. More features include print trim, host-addressable printing. and support of twisted pair or twin-axial capting.

1196 A/B DISPLAY STATION

S/3X and AS/400 ENV

If you're unaware of Memorex Telex's total commitment to midrange users, consider this fact: We offer you the world's most comprehensive

ENVIRONMENT line of plug compatible products for S/3X and AS/400 environments. Period.

That means everything you want, from nobody else.

Personal systems and workstations. Display stations. Impact and non-impact printers. Systems printers. Disk and tage storage devices. Add in memory and other system upgrades. Man we R&D ourselves Others.

we OEM-source and enhance. All of them we continually evaluate and upgrade to give you uncompromised quality, reliability and performance. Today, tomorrow, and well into the next century.

Which, for midrange users, is good news in any language.

introducing state-of-the-art storage that's 100% compatible with the 3480 standard. Configured with an automatic cartridge leader, the 5460 Subsystem can back up more than two gigabytes of data without

operator intervention.
The 3261/817 Subsystem is the midrange industry standard for save restore operations. Pully compatible with 3422 and 3420 tage systems, it offers densities of 1600/6250 bpi with data transfer rates from 200kb to 1250kb per second.

The 1196 A/B full-function 12* full-function 12* Monochrome Display Station features a choice of 83-, 102 or 122-key key boards as well as host-addressable print support. Sup ports twisted pair or

twinaxial cabling.



3890 DISK DRIVE SUBSYSTEM

CONG SOUR STALE SOUSTSTAN

The 3890 Disk Drive Subsystem, our latest generation of disk drives, is an inmonative approach to triple capacity. We reduced head disk assembly size to elekt lockes (from 14*) to improve reliability and service-allily, And to offer the industry's best price and capacity per square fool.

5480/SP2 CARTRIDGE TAPE SUBSYSTEM

Large Storage SYSTEMS generation ago. And

Who packs more facts in a square foot than anybody? Memorex Telex.

We pioneered our first disk drive storage unit a

VIO each succeeding generation of Memorex Telex devices - from tape to solid state to cartridge robotics - has meant more costeffective storage, processed faster, easier to expand. and simpler to operate.

All with floorspace savings that crowd neither computer rooms nor budgets.

But hardware is just the beginning Our Customer Engineers and support teams # are peripheral, channel and mainframetrained. From the first analysis to the last test run. you'll get the seasoned systems service you need in your nonstop, real-time environment.

We're building on the success and reliability of the 5480 Cartridge Tape Subsystem with a simple, space-saving idea; stack them! This 5480 Special Package offers the highest capacity-per-square-foot in the industry, and sets new standards for ease of operation and maintainability New robotic options vastly increase data flandling flexibility and speed.

1Mbit semiconductor storage technology makes the 6890 Solid State Subsystem high-performance system perfect for critical, frequently accessed data. Solid state means no moving parts and no seek time. Its thousands of operations per second boost user productivity. Holds both temporary system files and permanent production data



THE PERSON CONTROLL

FUNCTION DISPLAY





The highly-reliable choice for high volume printing the EEM Coax Matrix Printer is rugged, supports IPDS and is user-friendly. Forms modules make supports fast and keep paper alignment perfect. Handles four and eight-code printing. Best of all, its LCD message center-speaks in English, not cryptic codes.

1324 COAX MATRIX PRINTER

A versasile net working platform in Aversasile net working platform to the Controller of the sure therefore that go far beyond current standards. Support of the controller of

With an array of screen stees specialized keybourth and a new modsize design, the IMS2 Enhanced enhanced severator product vitis. These skipsins offer setteres you can't find on other 3274 products programmable-bose colors. He marking for clear secretification of 132 calculum, so-accreen calculation functions and local screen print capability for easy desistance or large secretions. C19A COMBINED FUNCTION TERMINAL

Perhaps nowhere is the Memorex Telex commitment to value-added innovation more evident than in our 3270 market displays, printers and NETWORKS controllers. And no

It's a simple and successful formula: We listen

to our customers, anticipate their needs, and deliver solutions. Year after year.

The result is an extensive family of products

The results an excursive family of products for the 3270 application environment that creates an industry standard. A complete range of displays, from basic to multi-function. Controllers for simple or advanced networking applications.

New laser printers that attach to 3270 controllers, P.Cs and LAVs simultaneously.

All 100% plug compatible. And all 100% conversant in your business language.

The CBN Combined Function Terminal provides desktop automation tools that dramatically enhance operator productivity. This 2270 plays compatible terminal provides multiple data communications, extensive windowing capabilities, inhancin windowing capabilities, inhancin cleatures. That means operators conduct more calls, quickly and accurately under system information and auto-

mate repetitive tasks. Nobody combines functions better.



Memorex Telex is the world's Memorex Telex is the world largest supplier of plug-compat-lible computer products and supplies, and enjoys a prood reputation for innovation in the telecommunication and com-puter industry worldwide. Let us prove our fluency in the LANguage of your business by returning the card below.





MEMOREX TELEX

We speak the LANguage of business."

Picase send me more information about:

- □ Intelligent Workstation Products
 □ S3/X and AS/400* Environment Products
 □ Large Storage Systems
 □ 3270 Network Products
- ☐ GFT Products
 ☐ Controllers
 ☐ Printers
 ☐ Other _____

4343 S. 118th East Avenue Tuka, OK 74146

Memorex Telex is a trademark of Memorex Telex, N V Specifications subject to change

MAP showing limited growth, study says

BY ELLIS BOOKER

ing specification and support FTAM. He said the jury is

HE INFLU-ENCE of GM and oeing, which have jointly shepherd-ed the developing MAP standard, might not always have been

a good thing.

How large is Computerworld's total audience of computer-involved professionals?

620,000*

That's because we're the newspaper of record for information systems management. If you're still on the routing list instead of the subscriber list, now's the time to get your own copy of COMPUTERWORLD delivered fresh every week.

It will give you a complete rundown of everything that's happening in the computing arena. You'll stay on top of the news & mances of the industry and the praises and problems of its products.

Don't delay, order now. You'll get 51 information packed issues. Plus special bonus sections of COMPUTERWORLD Focus on Integration, You'll also get our special Spotlight section . . . featuring detailed head-to-head comparisons of the industry's latest products.

Use the postage paid subscription card bound into this issue and get your own subscription to COMPUTERWORLD.

*Audit Bureau of Circulations Susciemental Data Record, May 25, 1983



McDonnell Douglas video hits big time

BY ELISABETH HORWITT ST. LOUIS — For McDonnell Douglas Corp., videoconferencing is the next best.

Users now routinely set up videocon-encing meetings in order to work out

gement decisions or re-Videoconferencing sysdesign amo minagenem to account to a solve problems. Videoconferencing systems have boosted productivity and saved the cost of flying everyone out to one place, Augustine said. "You can have meetings quicker and usually get all the right people present at both ends, so you can arrive at better decisions more rapid—

"""." "" arrive at the present of the results are the results ar

ngs among its own sites, Mc-

While the price tag for such products has been dropping steadily over the past

Picturetel's systems cost only \$25,000 to \$30,000 and can be linked over dedicated or switched 56K or 112K bit/sec. links. This permits McDonnell Douglas to set up



number by year's end, Augustine said. However, the pr ucts' resolution level, which is comp ble to that of a standard television scre cannot transmit printed or written we ing documents so that they are reads

to provide as clear a transm

otion or large groups of people as a high-solution system, be said. McDonnell Douglas is awaiting two ex-ted events in videoconferencing: anpected events in videoconferrencing; another major price drop in high-resolution systems and ventors support, expected next year, of a CUITT standard that will allow different brands of systems to communicate. Right now, the only way to hook a Picturetel system to a CLI system is to put codecs back to back, he added. A future application plan at McDonnell Douglass is to hook up videoconferencing systems directly to enablective practice.

systems directly to engineering graphics workstations, Augustine said. "That's still at the investigative stage," he said.

TCP/IP CONTINUED FROM PAGE 51

take a bit on performance.

In announcing TCP/IP support, IBM
officials said again that they plan to add
native Ethernet to the AS/400. They did
not give a date for this event.

In another connectivity item in the AS/400 operating system, IBM said OS/400 Release 2 will be able to support comic interfaces through intelligent rorkstations attached to an AS/400. In May, IBM announced Easel, an icon

sc interface for 370 environments developed for the company by Interactive Images, Inc. in Woburn, Mass.

"IBM was absolutely startled by the demand for Earell from users," observed Aberdeen Group analyst John Logan.

"They hit a real hot button, and now the company of the co "They hit a real hot button, and now they're packaging it for the AS/400."

ic interface for 370 enviror



If you're thinking of putting an IBM monitor on your PS/2, you're not seeing the big picture.



When the cort is a displays, bugger is better. In a one te son with a Mudek Monton 432 monor from Vallays as the over IBMs own standard PS more than the cort is a displayed as the cort is a constant.

But it's control of the sont Bee use the 42 state at from Andes Altompany with over 12 to is experience and occurrent or monitor business. The code is controlled to the contr

The 42's 14 etched sint realflit screen price is "

Sea of the or Address is the Brish School of the State of

White one BMesing else et also paget processing

strong to the part bearing the form of the dealer neares

VOIL CALL I-SOU-PC AMDEK

Wollongong TCP/IP plans shift to desktop

BY JOANIE M. WEXLER

across the corporate network. Wolcomes are successful to the same DOS machine to access a Netwere server or a DEC server via TCP/IP." and David composition of the DEC server via TCP/IP. and David composition of the DEC server via TCP/IP. and David composition of the Pathway is asked to allow TCP/IP based connectivity to the following nevers: — Units and Microsoft Corp. OSZ systems supporting Server Message Block (SMB). Digital Equipment Corp. VMS systems supporting Server Message Block (SMB).

Pathway is said to support

Pathway is sate to support to ing workstation environments:

• Apple Computer, Inc. Macintoshes on Appletalk or Ethernet.

• MS-DOS systems running IBM Net-

 MS-DOS systems running NFS.
 Pathway incorporates the company's WINS TCP/IP products, which can be converted to Open Systems Interconnec standards. According to Langlais, Path way will be network-manageable "in short period of time.

While Pathway may not be the answer to all the interoperability needs of the dealtop user, it does provide a basic utility that users are seeking: a file system that addresses inconsistencies in operating systems. "Users have data in VMS, they want to get it into an Exce sadsheet. Pathway does this as a conspreadanet. Pathway does this as a consistent implementation over several platforms using a common protocol. That is better than using different Stone Age utilities for each connection." said analyst Mary Modahl at Forrester Research, Inc., a Cambridge, Mass., market research firm.

she added, however, that Pathway rives only as a foundation for more so-histicated functions such as graphical in-

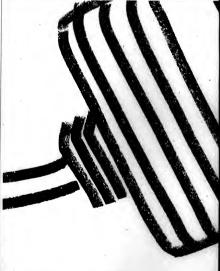
Networld

CONTINUED FROM PAGE 51

,000 packet/sec. Typical bridge roughput is 3,000 packet/sec. Available mediately, the 13000 starts at \$2,900. Andrew Corp. announced Bridge rt/7414. a Token-Ring-to-Token-Ring

rrester report. Vitalink, said to have 75% of the Eth-let bridge market, has Digital Equip-nt Corp. as a reseller.

wing: 802.3 Ethernet version of Vance erns, Inc.'s ATS 1000 LAN test and rais system. Priced from \$19,500, product is said to capture traffic



all trypis per trademarks of represent trademarks of their respective holders. Colorador and the "I' logs, per represent a sales from the to computing power 6.3 trademark of Colorador Corporation (CARCLE 2 impaired instruments of Cooks Corporation

Richardson CONTINUED FROM PAGE 51

and communications system.

The user interface issue has become moot, thanks to piedges of support for Motif. Motif has been available for only a short time, however, and there is a paucity of applications. The API will be a mix of proprietary — that is, VAX/VMS — and public standards, or Posix. The same

is true for communications. The database management system is the most crucial component for integration. This is where the role of the "fourth parties" — developers who have written applications on top of the third party products — comes into prominence. Sun Microsystems, for example, pursues value-added resellers that have written applications for DBMS from firms such as Oracle, Ingres, Sybase and Informix rather than stand-alone software vendors. The company believes this moves users closer to application inte-

Users' emphasis on preserving the software investment has led vendors to commit to "allicon independence." commit to "silicon independence."

DEC. IBM, HP and Sun are all moving to vide a common environment across

their multiple hardware lines.

The AAE concept is in concert with
the user's preference for a primary siteintegration platform. According to our integration platform. According to our surveys, more than 65% of Fortune 500 users plan to standardize on a primary

vendor, generally DEC, HP or IBM. Most users are only starting to defit their core AAE. In the next 24 months they will begin to require that all soft-ware purchased or developed internally must conform to it. The advantage they

The not-so-good news will fall on the cond-tier computer vendors that are able to line up a wide range of applica

tions support and on some integrators se primary role has been to tie tother disparate systems.

Stage Two defines industry-specific chitectures, which typically integrate

vertically oriented software packages with an AAE platform. If the early work of DEC and IBM is any indication, we ex-

pect many users to implement the first two stages concurrently.

DEC has teamed with a number of activative rendron to develop an AME sig-cifically for the Aerospace/Department of Defense market. This grees out of a project at the Honeywell Space and Str-tegic Avionics Division in Clearwater, Fi DEC worked with Consilians (slop-fice

to provide a paperiess, many, monagement system.

The "Clearwater solution" has been implemented at dozens of customer sites and was a key factor in Boeing's selection of DEC to be the prime IS integrator at its new \$235 million sheet metal

tibM mis targeted repetative uters — food and beverage, ph cals, chemical and consumer g panies — and has teamed with develop POMS, or Process Op

whide a strong core solution. So dis to rally the Unix software was seep DEC and IBM at buy, in Stage Three, users build on form work to develop an infor-

The move to standard architectus is in concert with users' desires to contrate on building products. It she simplify the integration aspects of C

DISOSS





If you bought it. chances are Datapoint can connect it.

If you want to connect any of these...

> IBM TATE Digital

Unisys lett-Packard Honeywell

NCR

Control Data

intel

Amdahl

Data General

Prime

NEC

or many others, we need to talk,

When it comes to large-scale networks, Datapoint can connect virtually any major make of computer hardware And our new DATALANIXA SMB server software can enhance your industry-standard network with a range of shared capabilities including NETBIOS, SNA, OSI, asynchronous communications, and ORACLE' RDBMS. With thousands of networks operating in more than 40 countries. Datapoint has the

experience you need to improve connectivity, maintain data security, and protect the asset value of your equipment. Link up with Datapoint. Call 1-800-334-9968. Or in Canada call 1-416-222-8005.

DATAPOINT Your link to computing pow

NEWPRODUCTS

rve is a con Prestoserve is a combination hard-ware and software product that reported-by reduces network server overhead and speeds network file-serving functions. It is said to consist of a software tape, a Mo-torola, Inc. VMEDus board, a battery backup system and documentation. Available in production quantities, the makes is \$7.00 cm.

Legato Systems 260 Sheridan A 260 Sheridan Ave. Pale Alto, Calif. 94306 415-329-7880

An IBM Personal Computer AT-compatible file server featuring an Intel Corp. 80386 CPU running at 20 MHz has been introduced by Goldstar Technology.

The GS320 reportedly comes with 1 M

byte of random-access memory, expand-able to 2M bytes on board, or 10M bytes of high-speed memory with an optional RAM board. According to Goldstar, the computer has one 5%-in. 1,2M-byte floppy drive,

serial and parallel ports, space for three our Ethernet versions. The adapter, in-half-height drives, eight expansion stots cluding certified driver software for No-and a real-time clock with battery backup. rear-time clock with battery backup suring 6.1 by 18.5 by 16 in., the sys-sells for \$3,195.

Goldstar Technology 1130 East Arques Ave. Sunnyvale, Calif. 94086 408-737-8575

Laptop computers can directly access Ethernet using an external adapter intro-duced by Xircom, Inc.

duced by Xircom, Inc.

The Xircom Pecket Ethernet Adapter plugs into a parallel port on an IBM Personal Computer or competible and connects to Ethernet cabing at its other end.

The 5- by 2- by .85-in. adapter is said to come in two models to accommodate vari-

Aircom Suite 114 22231 Mulholland Highway Woodland Hills, Calif. 91364 818-884-6755

Local-area networking

Tecmar, Inc. has upgraded its line of tape subprutems with an enhanced version of sizy 7005 setupons. The sizy 7005 setupons of sizy 7005 setupons. The sizy 7005 setupons of si 2.13 from a DAS workerstook without conversion. For current users, QTOS 1.12 is available as a free upgrade through Tecmar's Bulletin Board system. For \$25, a diskette and manual can be pur-

s25, a disterie and minus chased. Tecmar 6225 Cochran Road Solon, Ohio 44139-3377 216-349-0600

Powercore, Inc. has introduced a series of security tools for its Network Schedular group calendar for local-area networks.

The security program is included in all Network Schedular software packages starting with Version 5.0 and is said to enable an administrator to establish and maintain a list of authorized users for the scheduler.

scheduler, According to Powercore, each authorized user is giren levels of access for vivering and modifying appointment of a state of all states of a state of a sta

Powercore Issa.
Powercore
P.O. Bex 756
One Divernatech Drive
Manteno, Ill. 60950-0756
815-468-3737 Links

Mitek Systems Corp. has announced con-sectivity software products for the IBM System/36 and Application System/400. ect products connect

System/3 and Application Systems (Man Applicat



HEEF'S YOUR OPENING: Enter COMDEX, the premiere marketing and distribution trade event for comuter resellers worldwide. COMDEX/Pall '89 is the ultimate

pateway for new products destined for the global marketplace. It is the single the global marketjance. It is the single best opportunity for resellers wishing to interact with leading suppliers and new-to-market companies alike. Over 1700 exhibiting companies—300 or more from outside the U.S.—will be at COMDEX/Fall '69 to showcase virtu-

The renowned COMDEX Conference in where top industry experts will dis-cuss industry trends and forecasts, new product platforms and insights to help you device your own profit strategies for the 1990s. It is a dynamic network-

ing forum not to be mi Register MOW, Avoid long lines at the Show, and booked-up hotels in Las Vegas. Request complete pre-registration, hotel and travel information. It's the best way

re your place at COMDEX/Fall'89. Mail this coupon or fax or telex today.

OPEN THE GATES TO NEW BUSINESS OPPORTUNITIES AT COMDEX/FALL'89 Please send complete attender informs
 Please send complete orbibitor inform.

Otte	State
Telephone ()
THE IS CONDESSED.	6 10, 300 Pers Annua, Hardina des 160179
	FACE GROUP Inc.

Title ...

MANAGER'S JOURNAL

EXECUTIVE TRACK



r the overall data processision of Coast S

y, a division of Coast Saving insacial, Inc. that special-es in residential real estate nding and retail banking. Moles joins Coast from owney Savings and Loan ssociation, where he man-

Before that, Moles was a enior advisor at Systematics, sc., a vendor of processing vices and software for the

king and savings and loan He has also held IS man ement positions at Butter ld Savings and Loan in

ita Ana, Calif., and Fidelity leral Savings and Loan in ndale, Calif. ab Hofmann has been uned data processing man-jer at Nashville Wire roducts, Inc. in Nashville A native of Austria, Hof-

mann has 17 years of IS-related experience, including a

ment.

He did postgraduate work at Purdue University and holds a master'a degree in education administration from the University of Tennessee at Martin.

Hofmann lives with his wife and daughter in White Bluff, Tenn.

Who's on the go?

Changing jobe? Promoting an assistant? Your peers wa to know who is coming and ws about staff changes, be department write to on Wilder, Senior Edito agement, Comput-vid, Box 9171, 375 Cotuate Road, Framing-n, Mass. 01701-9171

Avon's Perry: Not just lip service

IS chief has made more than cosmetic changes with his emphasis on systems response PROFILE: Raymond Perry

BY ROBERT MORAN

Raymond Perry, Avo Products, Inc.'s corpe

"IS stands for impact and servi rry says, "but you earn the right to fiver an impact by delivering superi-

The 51-year-old mechanical en er, who was educated at Cornell Mobil Oil Corp., Xerox Corp. and the former Burroughs Corp., made his own impact on the then-batch-oriented Avon when he came on board in No-vember 1986.

Originally hired as vice-president for IS in the direct-selling group, the company's largest business unit, Perry was promoted to his present position in

The self-styled technological con-servative upgraded Avon's manufac-turing, marketing and payroll systems. turing, marketing and payroll systems, embraced imaging systems and installed an integrated T1 voice and data network. "There are more systems that are now on line," Perry says, "but I don't think that there is a need for Avon to he a risk-taker in terms of

Aron to be a reas-tance or seems on technology.

To Perry, IS service means just that—not fip service. He requires senior department personnel to be on-call around the clock, every day of the year. Carrying beepers, they fight against Perry's imperative: "If any ction system is down for more whether night, day or the weekend, I am always available. International centers have a 24-hour rule,"

ident of IS, Ason Products, Inc. rote vice-president of IS, Ason Products, Inc. vide consistently high leuds of service to end waves while improving bus

And he means it, according to his boss, Executive Vice-President of Banness Development and Planning Robert-Pratt, who recalls an early testing of Perry's mandate. "Some problems were left on Friday afternoon for Monday," Pratt says. "Ray made it very clear that he meant 24 hours a day, seven days a week."

ay, seven days a week."

Pratt characterizes Perry as a thorugh professional whose blend of basic
sperience and managerial expertise

has earned him respect within the ever-changing Avion. "Quite a bit has changed in information services since Ray's presence there, both in terms of the way the department and the way the department and the way the department interacts with the cheeses. First stellar, the control of the country of the country of the country of the cheese. The addition to fighting technological. In addition to fighting technological. In addition to fighting the conclusion of the cheese of a strengthed hostile take-over of Aron by financier living has over the control of the country of the control of the country of the control of the country of th

Sneaking research dollars past Finance

hnologists try out some of ngs, but how on earth will you corowed funding for them?

sultancy. Schneider believes that just as war may he too important to leave to the generals, research into potential me strategic technologies is too important to he left to the bean counters. So, Schneider urges information systems executives to set mide 2% for 5% of their total IS budget — or 5% of their total IS budget — or in some cases — for technology experimentation. He joiningly refers to the idea as a "hashi fund" but the interest is even reserved. pment of a corporate culture g, but not limited to, IS — that iges innovation and tolerates "There has to be a willingness

tent is very serious — to free up a few purse strings from the usual bonds of cost-benefit analysis and return on in-"Not enough of that type of experi-entation takes place in IS," hneider says. "Resources tend to go

GloBull



A small world? A global village? Not to someone trying to do business overseas.

If your computer problems are large, farflung, and international, give us a call. So are we. We're Bull.

A computer company for a business environment that's faster, harder, and more punishing every year. An environment in which traditional

ideas no longer work.

To succeed today, you need a different kind of computer company. A new one.

Know Bull. 1-800-233-BULL. Phone for a copy of our corporate brochure. Workhwide Information

Systems



BOOK REVIEW

A Macintosh high priest takes a big hite out of Apple

THE MACINTOSH WAY By Guy Kawasaki South Rosesman & Co. \$19.95

a park or

a wan carrines quickly stumapon a simple genetic truth: Dog
s often boar a frightening reto their shares. who has ever visited a park or U000 8 8

ishing Guy Kawasaki's The Macintosh Way, it may be about time to extend that

Way, it may be about time to extend that corollary to computer owners. In The Macintosh Way, Kawasaki lets the good times roll with a book that is as user-friendly, simple and elegant as the machine from whence it derives. The in-ception of Apple Computer, Inc. 'a Macis trented like a firefly in a jar, with Kawasatreated like a firefly in a jar, with Kawasa-ki carefully poling and prodding it to see what made it glow. In the process, he crafts an entertaining and thoroughly in-reverent guide to modern business suc-cess that in guaranteed to spark the entre-preneur in all of us.

Kawasaki served as a software evange-list at Apple for more than three years, boiled water daring the birth of the Mac-

and, like many present during those for-

mative years who have written a stumbled upon more personal insight and life truths than any Dalai Lama could hone to provide

But The Macintosh Way is much m

than a boastful retrospective. Although the Apple success story has reached the status of Norse legend in the computer in-dustry — and Kawasaki is justifiably ud of his contributions — he sweeps ay much of the myth.

The creation of the Mac, Kawi

writes, was nothing more than how one person — namely, Steve Jobs — got disgusted with mediocrity, drove his staff to ne borders of lunacy in his quest for per-crim and achieved an extraordinary lev-

of success.

Despite the wondrous picture that the
edia has painted of the Mac'a birth,
ere is no mention here of divine internition or Jobe' birth in a manger. It all
nanated from hard work supporting a

A few of the essentials are a deep prod A few of the essentials are a deep prod-uct (i.e., one that appeals to both captain and crew); 30-hour workweeks; the right office environment (\$10,000 speakers and a compact disc player help); a top-notch support staff; and an intelligent marketing campaign. In addition, throw in a few splashy T-shirts to advertise your

product. Kawasaki has spent a lot of time in the computer business. He now heads up acit-ware developer Acius, Inc., and he has nade his share of friends and ene along the way. Consequently, he seasons The Macintosh Way liberally with acer-bic but often deadly accurate observa-

es. Be forewarned: When the man is fired he wields a mean Wordperfect. up, he wields a mean Wordperfect.
Among the institutions he hits are Eather
Dyson's computer conferences ("where
computer industry people
brag about how smart they are,") marketing exphemisms ("a bug is an imperfection." In the computer industry people
brag about how smart they are,") marketing exphemisms ("a bug is an imperfection." In the computer of the ing experiments (a way is an unpersec-tion in your competitor's program ... with Apple it's an undocumented fea-ture,") and strategic alliances ("getting someone to announce that they are going to do what you know you would lose mon-

or delay? In stances, Kawasaki's diga border on the vicious. It would be unfair to say that Kawasaki has a chip on his shoulder concerning Ashton-Thet President Enbert, it was more like a dinett. While it is immediately clear that he in owy considers table to be a mercuntup prophet, Kawasaki has never forgiven. Elsefer for trying a benchmar in son Apple 16. lick Elser in the database throughout the book's 200 meters. the book's 200 pages.

The filp side Conversely, Kawasaki has a soft spot for user groups and chief executive officers who attend their meetings as well as commy presidents who man their own

booms a trade shows.

One thing he neglects to mention, however, the fine art of logrolling, which is graphically highlighted on the back cover where — goah, what a coincidence — the same people giving rave reviews of the book are those of whom he speaks administration of the contract owingly within. But all is not business gym

But all is not business gymmastics. Kawasaki also takes on that awful void between turning the PC off at night and returning the next morning — in all control files. With a few of Kawasaki's your social life. With a few of Kawasaki's your date like also is the ooly patient in the world' you'll he more popular than the void' you'll he more popular than beer at a ball game. Early in the book, Kawasaki offers as observation by General "Vinegar Joe" Science! "The lighter a monkey clamb; and the property of th

e business world, few words ring truer.
But if you use The Macintosh Way to en exposure, it will be new up that tree more quick

JAMES DALY



systems

For your nearest Zenith Data Systems authoricaler, call: 1-800-842-9000, ext. 1.



Heckuva way to run a network.

At first most networks are fast a

At first, most networks are fast and efficient. But as more people crowd aboard, they push their networks beyond capacity. Eventually, bottlenecks develop that make getting down to work a tough commute.

HYPERchannel*DX takes a different route.

It relieves congestion by building smooth

It releves congestion by building smooth connections between dissimilar networks. It easily exchanges data across different protocols and media, including Ethernet, TCP/IP, and HYPERchannel. And HYPERchannel-DX leaves the door open for evolving standards such as FDDI and OSI. So your network grows according to your needs instead of screeching to a halt.

Call 1-800-338-0122 for information on HYPERchannel-DX products, consulting, and worldwide support. Why take a local when you can ride the express?

Network Systems.

CONTINUED FROM PAGE 61

ees. While at Burroughs, Perry taught an introductory course in information sys-tems to MBA students at the University

tems to MBA students at the University of Michigan.

"Ray has the ability to elevate work-ers' knowledge and make them feel as if they already knew more than they thought they did," says Stu Bennel, an IS director who has worked with Perry for

director who has worked with Perry to three years.

Although Perry cain himself a technology conservative, Avon has forged ahead in imaging technology. Imaging is at the heart of the company's distribution system, which processes 50,000 orders each day from its five marketing and distribution facilities arross the U.S.

Scanners read purchase orders sent

representatives. That information is fed into warehouse-management and assembly-central systems that are based on Deen received in the more management of the more management of the more management of the more management. The firm is expanding its inseging placement, but Pervy declines to offer specificarm, but Pervy declines to offer specificary to the specificary of the specificary to the spec

Avon's IS is service. It ranges from such ostensibly small-scale offerings as one-hour response time on a personal compu-er Help desk to the more dramatic instal-

lation of IDNX, IBM's version of Integrated Services Digital Network. The Rye center even has a robotic mail cart called Ralph, which cruises slong a magnetic strip beneath the corporate car-pet making deliveries throughout the day.

Network payed?

Driven by cost swisse, future growth inspread survive lives that a fix desire a support of survive lives and a survive survive lives to the content of the

Replace one of your IBM mid-range or 3270 display printers and save time, space and money.

Do it by October 31, 1989 and save even more.

Replace all your IBM mid-range or 3270 display printers and save a lot more.

IBM printers seem to last forever. So you may not feel rushed to replace them.

But when you see how much your current printers are worth in a trade-in... and how many more functions the neutry announced IBM printers perform, how much faster they are, and how much they can lower your monthly operating costs, you'll rush to take advantage of this offer.

Actually, you do have to hurry. The printer trade-in savings end October 31, 1989. For more information about this offer, call us toll free at 1 800 343-5563. Or send in the coupon below and we will contact you

IBM Corporation Department 9001. Building 0042 740 New Grele Road Lexington, KY 40511	IBM.
or 3270 display printers and in my current printers befor I am most interested in Mod	re about the new IBM mid-range I bew much I can save by trading e 10/31/89. idlyl: 6262 (engraved band) 234 (dot band) 3816 (laser)
	The .
Company (
Store Address	
Cip 15 cm 17 Ep	
The same of the sa	Settember m/m
CW90	

Avon ceases animal testing

Now you have a new way to recruit university and college students planning computer careers:

Computerworld's second annual Campus Recruitment Edition



Issue Date: October 31, 1989 Close: September 29, 1989



If you recruit top computer career students on America's campuses, your message in this special issue will target more of them than any other newspaper or magazine!

Now you can recruit computer talent on campus without leaving your office!

That's because 115,000 copies of this special issue will be distributed to America's best and brightest students enrolled in Management Information Systems (MIS), Computer Science, Computer Engineering, Electrical Engineering, and just about any other computer-involved curricula.

Finally you can cost-effectively reach the quality and quantity of students you need!

And you can do it with just one ad in Computerworld's Campus Recruitment Edition! For a rate card reflecting complete campus distribution, call John Corrigan, Classified Advertising Director, at 800/343-6474 (in MA, 508/879-0700). But hurry . . this issue closes September 29!

Planned Editorial Features: (subject to revision)



- · MIS salary and job satisfaction survey
- Where are the best jobs?/What positions are hot?
- Experiences of recent MIS graduates in their first jobs and what helped them in school
- The MIS career ladder
 - · Profiles of acclaimed top level MIS executives
 - The strategic advantage of computers and how they play a key role in running a company

CALENDAR

information technology to sales and marketing for competitive advantage in will be the topic of the Fourth Annual Strategic Issues Conference spon-ciaios Support Technology, Inc. retruence, to be held Oct. 30 - Nov. 1 in Cambridge, Mass., will feature case

on the MIT Sloan School of Man-evelopment at MCI Communica-

If your Mac is at a loss for words, you'd better talk to Software Spectrum.



Get MacWrite II at Software Spectrum for only \$162.

The computer best known for its artistic prowess also has a great talent for working with words. And Software Spectrum has just what you need to un-leash it. Say hello to MacWrite® II, the new full-featured Macintosh® word processor from Claris**

MacWrite II combines all the advanced tools you need to prepare professional-quality documents. From one-sentence memos to 1,000-page re-ports. Features include footnotes and endnotes. Graphics integration and mul column capability. A 100,000-word dictionary and 220,000-synonym thesaurus tionary and 220,000-synonym thesaurus.

Plus a powerful mail merge function and editable page preview.

MacWrite II even lets you open several documents at once. And you can read

and write to files from other Macintosh word processors like Microsoft® Word. Best of all, MacWrite II has the same look and feel of the original MacWrite. So you

probably already know how to use it. What you may not know is all that Software Spectrum has to offer. Like a huge selection of in-stock titles. Substantial savings off suggested retail. And many special services for corporate customers that make software purchasing quick and

Plus, we're one of the few resellers in the entire country that can upgrade you to MacWrite II for no more than \$75. All you need is any previous version of MacWrite. So give Software Spectrum a call at

1-800-624-0503. Because if you're a Macintosh user, we definitely ought to talk.

SOFTWARE SPECTRUM

and and Maximits to a regiment trademark of Claric Corporation of Aprile Company, No., Microsoft to a regiment trademark of the



There's only one PBX system that won't be blown away by the future.

When the future comes knocking, only one PBX has both the flexible architecture and power to answer the challenge. The Fujitsu F9600." Unlike others who've retrofitted older PBXs, the F9600 was designed from the start to take advantage of emerging telecommunication services - like ISDN and broadband. For starters, its distributed processor architecture lets you add capacity and functionality simply by adding processor modules. Its single stage switching matrix provides smooth growth and fast processing of voice, data and, when you need it, broadband services such as video.

And thanks to its high-level applications-oriented software, new applications can be added as quickly as your needs change. Today, the system is performing worldwide in over 1,300 installations. Which shouldn't come as a surprise, considering Fuitsu Ltd. is a pioneer in ISDN technology and an \$18 billion global leader in computers and telecommunications. To see just how much better the F9600 really is, call Fujitsu Business Communication Systems at 1-800-654-0715. You'll find that with the F9600, the future's nothing to be afraid of.

COMMUNICATION SYSTEMS

Why VT320 Users Are Giving Their Nod Of Approval To Our 9320.



	9320	VT320	9320, we can smile and nod "yes."
70 Hz refresh rate	Yes	No	Want a display that's easier on the eyes? Our 9320 is flicker-
10 x 14 character cell	Yes	No	free, with large, easy-to-read characters.
2 pages memory cell	Yes	No	Need more memory than a DEC* VT320 has? We give you
Tilt and swivel base standard	Yes	No	twice as much, standard. Wouldn't dedicated Escape, Backspace and Linefeed keys be
DB25 pin and DECconnect* host and aux ports	Yes	No	much more functional? Our enhanced keyboard has them, for your
Set-up programmable function keys	Yes	No	convenience. It has to be 100% compatible, right? The 9320 is a perfect
VideoDesk* accessories	Yes	No	match in any DEC environment. The ideal choice for any UNIX® or
Dedicated Keys (Escape, Backspace, Linefeed)	Yes	No	ANSI-based system. The 9320 is built for reliability, with a single-board design.

Under \$500 using surface mount technology, and backed by a one-year limited warranty. Plus a lot more, for less than DEC charges. And the 9320 got Digital Review's nod of approval, too—receiving their 1989 Target Award as the "Best Alphanumeric Display Terminal" in the DEC market.

For more information fast, call toll-free or write today TeleVideo Systems, Inc., 550 E. Brokaw Road, P.O. Box 49048,

San Jose, CA 95161-9048. As the comparison chart shows, we know how to make

VT320 users, OEMS and VARs happier. Just give us the nod-

American Ingenuity, TeleVideo Know-How.

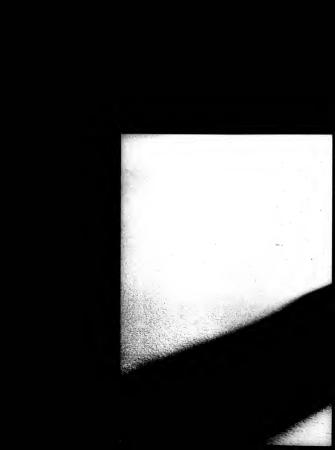
Call 1-800-826-9320

W haVe

InforMali In,

anl er ill

COS You.







AA AIRLEASE...

A STATE OF THE STA

1570 AIRPORT ROAD SKYVILLE, PA. 15032 TEL (412) 555-4000

J.M. MORRISON VICE PRESIDENT MARKETING

AN END TO VENDOR BOUNDARIES



IBM MAINFRAME

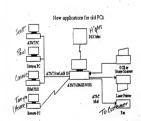
Introducing our New Networked

simple PC-to-mainframe package to 2 "connois-scur's" server for mission-critical applications) bring together more than in-formation. They bring together the people be-

important corporate data heid there. The key lies in a net-work builder's oasis called the AT&F Application



The Networked Com



dards (SNA in this case) that let AT&T's new Networked Computers work smoothly with the systems you already have.

How to share new applications and precious resources. Take the case of Scott, Paul, Connie and Tanya in the second diagram. They

each rely on expensive peripherals, but you can't afford to get them individual sets. And their complex, networked application would really

train your existing DOS Enter the AT&T

level UNIX® System V

6386/25 WGS, our entryserver. UNIX System V is the only desktop operating system designed for communication-intensive applications. And since it

also supports AT&T's
OPEN LOOK™ Graphical User Interface, life can be visibly easier.

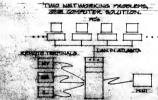
We've given the 6386/ 25 features that exploit the UNIX system's natural ability. So it's perfect for re-

source-sharing, database management and other applications DOS and OS/2"
just can't handle efficiently In fact, AT&T has con-

figured, packaged and tested solutions including communications, database and image servers. Just let us show you.



nputers. From AT&T.



ATETOMIC POWGS

Elimitencious solutions. Chances are you need a server to support information sharing in a local PC, introde. This enough, But harely a Networked Conjusce that will also reanage

ATRT 6316 8/33 MGS

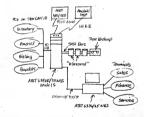
a nationwide database at the same time. With headquarters in Adanta, you have people in two dozen offices scatiered across the U.S.

in two dozen offices scartered across the U.S., Because geography makes interoffice agreement difficult, you feel more like rwenty-five little companies than one big one. In Arlanta, put 600 MB

nies than one big one.
In Atlanta, put 600 MB
of data into the disk space
of an ATRIC 63868/33
WGS Place asynch turmimis in your field offices,
and connect them directly
to the 63868/33 WGS.
Suddenly, everyone's work-

everything. Which, at about 7.7 MIPS, is power that would make some mainframes blush. Now, shift into high

Now shift into high gear by connecting the PLAN you already have in-Atlanta. We provide the systems and emperime you need to support LAN on remote remote remote along times at the issue, the same hard for subselfors of the Networked Gongana, our solutions if the America for subselfors of the contraction of the contrac



of information from people in one department can trigger action by people in another.

To protect all that infor-

feature that performs automatic, instantaneous backople ups. And since the Model S comes with SCSI, you get seven times more storage than non-SCSI 386

To protect all that information, we include a special "disk mirroring" On top of that, we test and warrant" each ele-

and warrant "each element of the package, then
assemble the complete
system, including SCSI
devices, UNIX System V
operating system, StarLAN
10 networking hardware.
Let's talk: You'll find the
Networked Computing
experts make good

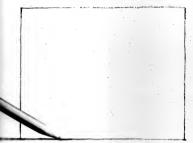
install and integrate the Networked Computers in as many different ways as you have needs. To learn more, simply call your AT&T Authorized Reseller or AT&T Account Executive. Or just turn the page.



APRT 63 % E/25 W65 MALLES

Show us your networked computing problem.

Draw or explain it below, and then Fax it to us at 1 800 833-6386, and a sales representative will call you. Or call your AT&T Authorized Reseller, AT&T Account Executive, or 1 800 247-1212, Ext. 162, for more information.



Please give us the following information so we can best help you.

Name				_
Company.				
Address				٠
City	State	Zip_		_
Phone ()			_
Type of bu	siness er of Jocations		• •	
Purchase is	stance time farme			



Publication ad appeared in

HARDWARE ROUNDUP

LARGE AND MEDIUM-SCALE SYSTEMS

EMARY HAMILTON
hen they write the history of large systems,
that will stand out in the
upter for the past 12
with will not be IBM
- the plug-compatible
updacturers (PCAD, In-

and the plug-compath
manufacturers (PCM). I
stead, those who took to
boddest steps came from oo
side, the IBM market. Wis
IBM and PCMs built on found
tions hid the previous year, U
sys Corp. and Bull H. N. Infe
mation Systems, Inc. unhered
new mainfigrame generations.

be the year's biggest mainfram breakthrough has not yet ar rived, and when it does, it will not be coming from any of the eatablished players. The candidate for surprise company of the year is Digital Equipment Coppwhich is expected to announce its first bons fide mainframe, the

VAX 9000, in October.

Published reports claim the air-cooled DBC mainframe with be offered as a uniprocessor system in the 30 VAX units of performance range. The VAX 900 is expected to offer typical main frame features, such as enhanced system recovery with re-

other traditional minicomput vendors such as Data Gene Corp. and Prime Computer, Is stepped into the large-systes arena with mainframe-class of

The DG entry came in h
1988, when it introduced
largest system ever. T
MV/40000, which is score
some hits in the installed be
can be configured into a 50 n
lion instructions per seco
(MIPS) machine with four p

In late summer, Prime ca out with its EXL 1200 sets Based on the Sequent Compu Systems, Inc. Unix-based p cessor, the EXL 1200 report by can be configured into a 1 MIPS muchine. The compu says it will support up to 1,6

Hamilton is Computermente's editor, systems.

Few solid hits from regular lineup



database management and office automation applications. Although observers doubt

Although observers doubt ing to Frank that these systems will directly compete with the more established

mainframe offerings, they are seen as important moves to hold on to installed bases.

INSIDE

ining a

Ill Image
SC is helping adors poisth size systems.

10 Peath and Alimony
ETA's demise, rift at Cray top supercomputin news. Page 84.

Small, But Significant Minisupers take I stab at expanding their niche. Page 85. a growth path for their own is stalled bases."

same problem: an industrywich slowdown in demand. "The vendors may have

wanted to force change, but the customers wanted to move in a evolutionary way," points of Michael Geran, an analyst: Nikko Securities in New Yor "Seduction doesn't work in the customer of the control of the customer of th

The whole computer industry fell victim to a general slowdown in demand last year. "Capital spending in general has stalled, and MIS spending has alowed

iding their own

nificant upawing yet this year, analysts say that most mainframe vendors either maintained their position or did slightly better than last year. IDC is predicting that the large-systems vendors group will ship approximately 60 units less in 1989 than it did in 1988, when 1,460 main-

Donald Beloomy, an IDC mahyst, says these shipmant sumbers show that mainframe sensing the shipmant sumbers show that mainframe sensing the shipmant shipmant shipmant ship shipmant shipmant shipmant shipmant shipmant (Jaham shipmant shi

none-what thoughsh manner. Some observers said the relative health of the mainframe industry supports the theory that users are moving to a two-tiered architecture that would greatly distinish the need for midrange systems. Their future picture includes very high-performance dedicated mainframes linked to scores of intelligent work-

"It grew in a very controlled way, but the key point is that the finosaur isn't a dinosaur," Geras says. "The large-scale market was better than the minicomput or market. It's the big switch."

Few solid hits

renue gains, most have had better are in terms of profits. Reduced profi-fity, in turn, brought on cutbacks and offs. Although brussed, these compa-s managed to update their product on throughout the last 12 months.

The IBM world One reason for this year's lower profit-ability was that, with few users chomping at the bit, IBM and PCMs found then-selves in even more heated competition than usual. Gens claims that behind-the-aceise price wars, with discounts of 25%

ad moire, were commonplace.

On the new-product froat, IBM and its
no primary competitors, Aundahl Corp.,
all National Advanced Systems (NAS),
spet up the traditional it-fer-rat game,
not of which contered on higher performance hardware and the new operating
princonnent from IBM, MVS/ESA.

ESA is the next frontier in large-spectrum compating because it opens up storage facilities and is said to improve the performance of the applications such as BM's DB2 relational database management system. For instance, it offers ment system. For instance, it offers the performance of the best this year's story was not of PCMs, hasaled by IBM — perhaps because IBM hasaled by IBM — perhaps because IBM had enough of its own probleme. IBM had the most challenge of the perhaps the per

allenging year. At the tail end of 1988, it managed rel-ively smooth launches for both ESA and

In February, the company introduced the 3090 100S, the new low end of the S family, which brought the point of entry to the latest mainframe generation —

to the latest mainframe generation — and, presumably, to ESA — to below \$1 million. All together, the anving to the newest es and operating

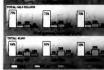
vironment was the thing do.

The first sign of trouble me in March when IBM mounced that it had expe-ned in 3090 S models. The sip problem, which IBM fased to clearly define, used enough S model sipment delays to nega-nety affect first-quarter venue.

But IBM insisted that the problem was fixed and it expredied to get bedoo at track problem with the problem was fixed and it express. Unfortunately for the problem was done of its fixed maps in the problem was done of the maps EAs and 3000 S model push of month earlier. In the problem is norther maps EAs and 3000 S model push of month earlier. In the problem is norther maps EAs and 3000 S model push of month earlier. In the problem is norther maps 3000 and more EAS discentives. This time, IBM design, festigned as partmericals canonical conditions.

buted the 3090 380S, which, for the first time, featured an asymmetrical capability for 3090s. Restricted to S models, this new feature, which IBM said it would eventually expend to all two-sided S mod-els, would allow users to configure differnounts of expanded storage and compile. Provincingly, to see but to stack the most of the 5 midst nime. "Silter the more monoton of both one and allow the bears grown on the the problems." The street here was to see monoton. The break here was not seen monoton. The break here was not to stack the street of the s

Oops, I slipped . . . While IBM continues to remain the solid leader in the mainframe morbet it has lost crossed to its account risal I laises



will have moved to the new operating environment by year's end. However, random inter-views by Computerwise throughout 1989 showed throughout 1989 showed that users, while committed to ESA, are moving slightly more cautiously than that 50% estimate would indi-

Cate, Monetheless, the foundation was put in place. "For the past 12 months, ESA has been a marketing suctions of the problems beyond the chip problems without a real train of disasted Group, a Booton consulting film.

gaining momentum in its quest for ESA/3090 S model implementation. Then, in June, reports began to surface that S model thermal conduction modules were failing in the field.

deen Group, a Boston consulting firm. In fact, some observers are own thinking beyond the S models to the next piacus specialism on the next and final 3990 series, which is known as the Go A neries. Opinion is mixed, with some predicting a full debut, while others maintain it will be introduced in early 1990.

Gens says he expect that IBM's trooper traw way with the Geries amountment. The post year was also a roller-conster Observers stributed these failures to the earlier chip problem and claimed that IBM did not catch all the flawed chips that were initially produced. IBM vehemently were initially produced. IBM vehemently denied this and claimed there had been only the few isolated failures typical of a new generation of systems. By late sum-mer, it appeared that IBM had weathered

KEDIT 4.0 XEDIT COMPATIBLE PC EDITOR

KEDIT" is a text editor for DOS and OS/2 that supports most com-monds and features of XEDIT. BMs editor for VM/CMS But KEDIT goes beyond XEDIT compatibility with special PC-based fea-tures for a first-late combina-tion of mointrame power and PC festality.

- More than 100 XEDIT com-patible commands and SET options, including the ALL
- m XEDIT prefix commands, targets, and fullscreen layout. Multiple files, multiple
- #Built-in subset of the REXX macro language included.
- Interfaces to Personal REXX, our complete implementation of REXX.
- **Enhanced block operations** And much, much more

MANSFELD

P.O. Box 532, Stors CT (203) 429-8402



While KEDIT remains true to its "While KEDIT remoins true to its heritage in retaining compolibility with the maintrame XEDIT, it is also one of the most feature-packed PC lest editors around! PC Magazine, 10/31/88

DOS Version: \$150 OS/2 Version: \$175 (Includes DOS version)

ng: \$3 version available

Mainframe monthly

October: Data General introduces a new high-end machine, the MV/ 40000, which can be configured with

November: Honeywell Bull, Inc. (now Bull H. N. Information Systems, Inc.) introduces a high-end mainframe that the weador claims offers twice the

December: The long-standing IBM/ Pulitsu tiff is officially resolved by the American Arbitration Association. The dispute, which dates back to the early 1960s, focused on Fujitsu's ac-cess to IBM source code.

nary: Unisys introduces its first scale implementation of a main-t, the deaktop Micro A. The new m brings the entry point to the pamainframe line below \$50,000.

February: IBM makes two an-nouscements designed to serve as in-centives for users to move to ESA. One is new ESA software; the other is the discontinuation of the sale of base-model, non-ESA 3090s.

March: The industry gets the fir public report from IBM that son S model shipments will be delayed b

April: IBM puts more weight behind its push for ESA with the announcement of a new 9000, the Model 380S, which features an asymmetrical capability, Aunchlai neuroneur what it is heapen to an impose the more of the season of the state of the season of the

May: Hitachi and EDS finalize their joint purchase of NAS, marking Hita-chi's entry into the U.S. market as a fi-rect seller of mainframes. The venture will continue to sell under the NAS is-

July: IBM cancels the product an-nouncement of its long-awaited 3390

agust: Amdahl unveils ESA on its inframe one work after rival NAS, iming that it can deliver lower end items with ESA compatibility by Oc-er and that higher end by90 main-mes will be ESA-ready in January.

ride for the two major PCMs — Amdahl and NAS. The highs were provided by a number of successes — and, in Amdahl's case, a bit of one-tenanship — in the ongoing game of catch-up that these vendors play with IBM.

dorn play with IBM.

Both computies said they would demonstrate systems with ESA capability in 1989, and both kept that processe. Ambies and the said between the said and NAS will be making this capability available a full year after IBM, but the time lag should not affect them too much. A recent random survey of PCM users showed that a good chush of them are planning ESA implementation for 1990 (CW Aus. 21).

planning ESA implementation for 1990 (EW, Aug. 21).
Anothal jumped into 1999 with a blass of glory. It first reported a stellar 1988 that showed a 53% earnings increase, to 31.8 billion. Next it unnounced to the combanced version of its mainframe-based Units operating system, which was all the more sweet for Anothal, because IBM was strugging to get its mainframe-based Units out the door.

Perhaps the first sign that things were not perfect came when Amdahl pulled a

LTHOUGH IT DID well with product rollouts, Unisys was . hit hard with the softened demand for mainframes in the U.S. this year.

copycat move and upped prices on most of its hardware by 5% in early April — a move that IBM bad made in late March. But that was quicky followed in late April with the rolloud of several new systems, including the 5990 Model 350, the factest uniprocessor mainframe to date, which supposedly runs at 25 MIPS. Previously, NAS boasted that its AS/EX 60, at 27 MIPS, was the fastient unsprocessor

nainframe. Then, in July, Amdahl announced earn-ags of \$32.8 million, 38% less than in the same quarter a year ago. The company at-tributed the expected dip to customers moving to its new models; Amdahl also cited increasingly competitive pricing from IBM.

from IBM.

The dips and peaks experienced by NAS in the peat year had more to do with corporate identity and direction than with products. Most of the year was overshadowed by its ownership question.

It wasn't Memorax Rumors floated around the industry for months that the firm was on the block. In early 1989, it appeared that Memorax Telex would become the new owner. But weeks of uncertainty followed as Me-morax Telex missed two deadlines to step

in as the new owner. In Masch the team of Hitachi America Ltd. and Electronic Data Systems Corp. came in as the new owners, and the joint venture was finalized in May.

Other than its ESA demonstration, NAS had little to show on the product

NAS had little to show on the product front. Recently, a company problemma said the ownership issue did not affect the firm's plans to release products. Instead, be said the last 12 months were a time of adding enhancement to the latter AS/EX models, which were introduced a year, or for instance, the company made a logical partitioning facility available for users of those mainfarmers is just outers of those mainfarmers is just on the product of the pr

Analysts were positive about the new corporate purents and expect the union to give NAS a boost. "In the long run, this give IAS a tooost. "In the long run, this acquisition will be a real shot in the arm for them," says Jeffry Beeler, an analyst at Dataquest, Inc. "They'll be a more for-midable competitor than they have been

midable compensor than they have occus in the recent past."

The world outside of the IBM market, once made up of the so-called BUNCH companies, is now a much smaller collec-tion, headed these days by Unisys Corp. and Bull.

That due held their own in terms of

taking the plunge into the IBM-compati-ble world.
"Unitys and the others continue to isy an installed base strategy," Gens ays. "The bad news for Unisys is that

says. "The bad news for Unitys is that their customer bease are always evaluat-ing the option of making the move to the BM arean. The momentum is toward the (BM) 370 architecture, and so they have (BM) 370 architecture, and so they have costs, Unitys was hit hard with the soft-costs, Unitys was hit hard with the soft-ened demand for mainframes in the U.S. this year. At summer's end, the company and foliated inventories would cause it to cut thousands of employees — 5% of its These moves are out of an overall reproduct releases in the last 12 months, with each delivering new top-of-the-line mainframes. The key to their success, analysts say, was keeping their installed bases happy enough to prevent them from These moves are part of an overall re-structuring that will be taking place at the

company over the next several menths. Unions had wropped up 1860 by strand-bloom — It mounted to 1860 by strand-bloom — It mounted to 1860 by strand-bloom — It mounted to 1870 by strand-bloom — It may be strand to 1870 by strand

The Scamp chip is significant for users

— Continued on page 77

For IBM 3270, S/36/38, and 4S/400 Users:

100% IBM 4224 mpatible.

Now you have an alternative the Model 7224 printers from Interface Systems.

Printer Solutions for IBM Syste

place IBM's Model 3287, 3286 and 4214 printers, among oth in addition to the 4224. An enhanced 4224-compath control panel and two-line, 32-character LCD make

A AILABLE HORLOHIDE!

NEED REMOTE ACCESS TO YOUR 3270 NETWORK?

WE HAVE A SMALL SUGGESTION!



The Informer 213 portable terminal.

The only light weight 3178 compatible terminal designed specifically to provide remote access to your IBM 3270 environment. Nothing offers you a more complete solution.

This compact little eight pound powerhouse includes a built-in syn-

chronous modem that operates up to 9600 baud and emulates a 3274 control unit with an attached 3178 Mod 2 terminal. Making communications to the host computer as simple as pluging into any RF-II phone outlet and striking a single key.

The Informer 213 lets you establish a low cost dialin network over standard or leased lines with the data integrity of SNA protocols.

So you'll always feel at home when you're away, we

designed the 213 to perform and feel just like your 3178 terminal. From the detachable 3270 compatible keyboard, to the electroluminescent 80 character by 25 line screen with status line. It's all there.

If you've been looking for a portable 3270 solution that's as strong on communication as it is on compati-

bility, give us a call at (714) 891-1112.

We think you'll be surprised when you see what a great little suggestion

Computer Terminals, Inc

Informer Computer Terminals, 12781 Pala Drive, Garden Grave, California 92641.
Informer is a registered trademark of Informer Computer Terminals, Inc.
18M is a registered trademark of International Business Machines Comporation.

the 213 really is.

Large systems

VENOCE .	PRODUCT	DATE PREST INSTALLED	LESSYW JEYWELL	MOST COMPASABLE ISM OR DEC STSTEM	LEGINISTRATION	LENOUS DAYPOLINA	латинома	MACHINE CYCLE THRE (seed)	MEDICOLY SANOR (magadytes)	("see/apAquibee) HVS HASNEYH NSSG	MUMBER OF PORTS	NAMES OF OLUMNICS	OPERATING SPETIMS	SUPPORTS CHARBART OR TOKEN-RING	MAXIMUM HUMBER OF USERS/ TYPICAL NUMBER OF USERS	Persi Napern GROM	Disk PPM	резтавилон
match Corp.	2001-0002	Sept. 1807	DP, 55, TP	IN 1886	18.4	107	107	18	33-386	4	107	10-45	THE WITE	107	147	107	BLIMAM	
100-0000	1000-100E	Jane 1967	Ξ.		25,4	107	107	10	20-204	4.5	107	10-40 .	-	107	107	367	ST.ANI.DOS	-
	1000-2002	March 1997	=:	-	34	×	NP	10	44-004	u	307	35-04	See a	×	×	200	23,594,600	M -
	1000 MINE		įį	_	a	*	MP	10	04-355	45	M	2544	Ξ.	10	*	*	PC300.00 .	N-
	100-100	Dec. 1980	i	-		107	*	16	208-012	45	HP .	6466	=:	XP	107	107	94.857.000 94.857.000	-
	5000-200E		=:		10	107	N7	10	130-613	4	107	64-135	=	*	107	10	98,862,660	<u>-</u>
	1200-4002	Dec. 1997	=		75	107	*	20	64-1900	4	N.	22-66	-	-	-	-	SUMMO .	~
	100-300 100-300	April 1986 May 2300	=		-	107	107	38	04-1500	45	100	394	=	100	~	100	NAME OF TAXABLE PARTY.	
	PRE-200	han Man	Ξ.		-	-	W	28	64-1300	4	100	2044	=:	W	-	100	SLAME NO.	Date:
	1000-1100	100 I	=		n -	NP -	107	18	1	45	100	44/10	=	107	100	107	30,070,000	Del com
	2000-1400	Dec. 1900	Ξ:		133	100	-	10	136 2500 136 2500	44	MP.	64-136	=	HT	107	367	*	Del me
bull E. R. Information Systems. Inc. ol 17) 805-8000	DES NORT	Pounds 1984	DP. 10. 17		NA.	1100	64 TPS DC. SELP.1.64 LL turned	100	33-136	89	18	×	CCOMM	ben .	1,376	38	\$1,560,000 with CPG, system control stiff, 1256 byte memory, \$0 processor, system control setting, preser marries	M=
	DPS MANN. MET	Second quarter 1985	DP, SR, TP	Dict Scot	NA .	34 (II)	151 T75 DC, 10 LF, 7.60 U. Scenal)	307	32-136	**	33	4	SCORE	Beth	2,395	10	\$4,500,000 () system control and, 1 (0) provingency, \$5,520,000 (2) system control gate, 2 (0) provingency code, 2 (0), 2504 days controller, private controller, priv	Ent sper
	DPS MASS	There counter 1500	DP. SK. 17	2004 2000	HA.	81.00	234 TFS DC. 15 137, 11.50 13. (actual)	100	64-256	10	*	64	CONS	Ben	10F/ 3,440	38	28,500,000 was 2 CPOs 2 system control units, 32M-layer unitary, 2100 processors, 2 system controllers, procer	to an
	GPS 90/94	Pourth quarter 1988	DP. SS. 17	GR4 5090	NA	308 (P)	270 375 DC. 20 LP. 15.36 LL Section 0	NF	64-256	NP	*		GCOSE	Sen	107y 4,850	10	ST JOO. NOT with 4 CPCs, 2 system control onts, 3264-byte messay, 43/0 processors, Esystem controllers, power messalers	the war
	DFS 8000/92 83,64	Third marker 1967 Oktober 823, there 1960	DF. TF	1884 3000	NA.	•	SO, TS, 300 TPS DC (setted)	37	32-256	10	NA	22,46.64	SCORE	Buth	1,165, 1,470	*	\$1.300.000 (2 CPGs, 2 SO precessor); \$1.255.000 (2 CPGs, 3 SO precessor); \$2.379.000 (4 CPGs, 4 (6) precessor) with 2 contain central with, \$2.500 (by manner); prever supplies	-
	162 2000	June 1909	DP. SE. 11	SSM 3090	MA	307	273 TFS DC (actual)	107	120-512	109	NA	128	GCOSS	Ben	NP	38	system control and, 12004 type mannery, \$1	-
	tes seconst	July 1509	DP, SE, 11	E864 3090	MA	30	SINTES DC	M	256- 1004	HP	NA.	254	GCOSe	587	**	10	\$11,240,400 with 1 CPGs, 2 system control man, 25454 byte manony, 2 MO	-
	DES 9000/93	Aug. 1989	DP. SK. TI	NA.	NA	MF	764 TPSDC Garrend	X7	254- 3604	NP .	HA	254	GCOM	200	NP	36	\$17,317,300 =0.3 CPUs, 7 ms. 2500 tops 7,310	100-
	DPS 9000/94	Fearth marker 1500	DP. SE, TO	NA .	NA	10"	1000 TPS DE Section D	7	254- 1604	NP	MA	256	scoss	Seb	*	26	222 947,480 with 4 CPUs, 2 greates centers sints, 25664 depts success, 4 MO	-

Vincea	MOBUCT	DATE PREST PREVALLED	PRIMARY MARKET	MOST COMPARABLE HAM OR DEC SYSTEM	PERCONANCE (MIPST)	LitaOtani zoniversoasa	BPICHAKE*	MACHINE CYCLE TIME (need)	MEMORY RANGE (megabytes)	DEK TRANSFER RATT (reegebyts/sec.)	NUMBER OF PORTS	NUMBER OF CHANNELS	OPERATING STREMS	SUPPORTS THERMIT OR TOXEN BING	MAXIMUM NUMBER OF USERS/ TYPICAL NUMBER OF USERS	WORD LINGTH (MM)	PAS PAG	NOUMBERS
-	Color 500-01, 20	Sept. 1888	NP. NR. TF	DA: 3000	33 Ar- 32 PL 66.60- 75.32	2100 2100	131P behal	10	04-206	15-17	×	884	HOMITE	Manue	United J 2000-2000	*	ELIMANO COLLA	
	Cotor 104-10, 30	Sept. 1984	17, 28, 77	The 3000	22 A	17.3 (A.	DD Great	*	04-255	1.5-12	~	34-63	HOSAYE. HOSANE	Patrice.	Side / 200-200	4	12,100,000 (CO). 16,300,000 (CO). 16,300,000 (CO).	
	Cotor SED-21, 20	Ost. 1988	=-	DEC WAT SHEET	17.05 36.1	2300	305.44 DC. 3.3 LP. 3.7 LE	11.3	64-350	1.0-10	XF	-30	HOLVE	Etherne	300	*	9861,790 (1 CPU). \$1.570,300 (2 CPU); with 6404-byte meaning orgin 10-channels	-
	Cythar See-45, 35	Oct. 1986	=-		=	23.00		11.2	64-200	1.3-12	ю	34-52	HOS/VE.	Itheras	Units/ 110-200	*	STATEMORPO	-
Date General Corp. (8000 530-3436	Eclipse MY/succe MA Santas	1984		364 3090	14.3- 54.2	NP	17 1-65 6 DEC Z O (cettinatu)	50	64-156	60	3,456	7	MONTS	Efternet.	1,200	32	\$629,000-\$1,545,000 with \$436 to \$636 type memory, one \$0	Del com OEM, VI
Name and Address of the	TRE 1000	July 2000	4	NA.	Ep to N	NP THE	NP	29	125-150	11	×	37	VMS	Diamet	325 1,000	30	STEE STORY WAS TREED	End one
1000 434-3335	3000 Made 1906	Aug. 1988		NA	NP	107	NF	18.5	32-64	45	NP	16-32	MVS. VM. TFF, VSE	Each	NP	32	\$1,008,000 with 12 channels, CPU	MP
	3000 Madel 1505	Aug. 1998	м	MA	HP	NP	NP	17.75	32-254	4.5	NF	16-32	MYS VM.	Beta	HT	22	\$1,713,000 web 18	NP
	3099 Mindel 1795	Nov. 1500		NA .	эф	NP	107	17.75	32-156	45	Юř	.16-32	Steer to above	ten:	NP	32	\$2,385,000 with \$6	307
	3000 Model 1805	Her, 1988	AB .	MA	107	133(7)	IOLL	15	32-156	4.5	мг	14-32	Same as above	Teth	NP	32	\$2,573,000 with 32	NT
	3990 Medici	Dec. 1986	All	XA	NP	NP	NP	15	64-512	45	NF	32.64	Same as above	Bea.	XF	32	Channels \$5,607,000 with 22	NP
	3090 Model	Nov. 1988	AL.	NO.	NP	294 (P)	NP	15	64-3334	45	30	32-64	Some as ab-	Bet	MP.	39	Channels EN 112 000 web 12	107
	2006 2006 Made 2545	June 1100	AR .	NA.	NP	107	107	12.75	54-512	-	NP.	27.64	Serve show	Shrib.	107	30	channels 53.753.000 with 32	NT
	2505	New 1984		XI.	100	399 (P)		13	64-1024	45	102	3544		Ben .	NP.	32	channels	NP NP
	300 144	-		MA .	-	300 (F)	NP	15					neite in glores				\$6,954,000 with 32 charmen	
	3005	-				-			128- 1280	4.5	70"	44-96	Same as obere	Beth	H	20	\$7,990,000 with 68 channels	NP
	9005 Mindal 9005	Dac. 1986		NA .	эPP	532 (P)		15	125- 2048	45	107	64-138	Some as above	Best .	NP	22	\$9,685,000 with \$4	NP TN
	3000 Madel 5005	Dec. 1906	-	NA.	100	66T (7)	No.	18	128- 2048	4.5	107	64-126	Same as above	Na	NT	32	\$11,361,000 with 64	PP .
	3000 Madel 600E	Sapt. 1986	48	KA.	×	794 (F)		15	138-	4.5	MP	64-198	MYS, VM, TPF, VSE	Tests	NP	22	\$12,836,000 was \$4	107
Principal Advanced Sprincipal Colonia Circ. 1999	AMEE TO, 20	=	207.30	TEM 2000	E7 13		11.111	×	33-396	34	NP	824	MYE VM MYSELA VM/EA MYSELA	R	PF .	20	\$7+0,480, \$1,117,150	Bad may
	AGES 10	7m 190	DP. SE	DM 2000	14	NP	MP	**	23-954	34	*	6-80	MENTAL PAR		707	30	\$1,50K,860	L-
	ANGEX SO	The	(#: SE	The 2000	11.7	MP	HP	*	35-354	34	NP.	F-303	MITTO VINE MITTO VINE	*	100	30	83,50,500	W -
	ASPECT ON SE	=	DP, 30	DEC 2000 .	11.74. 10	111.34. 48.07	176 LP.	16.5 GR . entyl	0406 IG. 13006- 3G. 25406- 3G	н	RP .	19-48, 60-126, 64-129	STEVA MYSEA THESE MYSES	100	107	20	\$2,304,300 \$6,400,300 \$6,500,000	lar-
	ANGEL 60, 30	=	19.SE	The 2000	38.3 58.9	IN O	OIP. SOUL Seekert. STATE Seeker) Checker (SO)	18.5	606-1G	34	MP	25-64	NOTE THE SOUTHER VALUE VA VALUE VALUE VA VALUE VALUE VALUE VALUE VALUE VALUE V	*	XP	10	85.456,376. 84.952,660	later.
	AMER NO		NP. 30	3000	*	*	7	36.5	Ment M	34	N7	35-06	METAL VINE	NP .	KP	20	\$6,547,560	-
	MIES 79	Park Service 1807	F. 12		44.3	NP .	*	38.5	164 15	34	*	3544	MYS, VILL MYSUL MYSUL VINEL MYSUS	per -	NP -	M	\$3,794,900	Del mer
	ASSET 76	*	DF. 70	2000	68. 5	*	*	34.5	X**	34	**	64-136	MYTE YEE MYTE YEE MYTERA YINGEL MYTERA	NP	×	20	\$7,348,300 ·	
	APE 10	*	FF. 30	3000	70	-	*	14.5	E .	н	10	64-130	MALE AND	×	~	*	10,594,400	lat me
Prime Computer, Inc. 1000 000-0000	erro.	Dec. 1987	*	104 3094. 165 6000	n.	NP .	MP	"	32-136	2.4	512	NA .	Principal	Etheren	telerate	33	\$311,600 with 3256- lets manage, \$1756 date, sermani, power	TAR
722 0000	TURNE, OR.	Os. 1980	7	Mr 3000	15-06	XA.	w	83	64-30F2	13-13	ю	Up to 20	Courdina (10	Eterne	HP			

/SNDOR	PACOUCT	DATE THEST INSTALLED	PRIMARY MARKET	MOST COMPARABLISM OR DEC SYSTEM	PREFORMANCE (MIPSY)	PERCHANACE (MITCHER)	BNCHWARK	MACHINE CYCLE TIME (MINC)	MEMORY EANSE (megadytes)	DISK TRANSPER HATT (megebyre/sec.)	HUMBER OF PORTS	NUMBER OF CHANNELS	OPERATING SYSTEMS	SUPPORTS EPHENNET OR TOKEN-RING	MAXIMUM HUMBER OF USERS/ TYPICAL PAINBER OF USERS	WORD LINGTH (NW)	Does three	esmannoe .
Corp. 110 545-4011	A 12, 128	500 1000 1007	DP. 17	(DOM 2000)	107	NP	107	66	34-144. 36-72	3	NP	25-46	MCPIAS	Ethernet	×	•	11,300,000, \$542,000 ato, CPU, 5630 tops	107
	AIST	May 1986	DF. TF	IRM 30965	HT	NP	307	60	36144	3	NP	**	MCPINS	Etherset	R	4	S2.13 F.000 who CPU, 3 GM Ayre commy, county, LCC unbeyours	×
	A197.RJ	May 1980	DP, TP	ISM 20005	ker	MP	100	65	68-200	3	307	64-129	MCFIAS	Disease	307	*.	\$3.33 E.DOO CO CPUTA Sc. 690.300 (1 CPUTA Sc. 500.300 CPUTA with GRAN CPUTA with GRAN CPUTA	M.
	AIRLN	Jena 1900 -	DF, TF	1304 MONE		HP .	NP.	**	44-676	1	NP	16-250	MOTAS	Edward	MP	46		M ²
	2300/405, 466	Aug. 1989	DP. TP	ERIC 2000S	NP	NP	10		36-84	,	30A	-44	O6(1100	Disease	10		SECTION OF CPUL S SOLESSES CPU	16
	2300411. 613	March 1980 .	DP. 55, TP	IRM 50005	7	NP .	100	18	33-44	3	107	4-64, 5-00	CELTITIO 200	Itherast	367	*	210 process of CPU, 22M-layer	167
	3500/031, 054	Mari 1990	DP. SS, TF	ERC 10005	*	*	*	15	-	•	10	10-170	C00/5 3400 500.0	Bhend	NP	*	23.500.600 () EO processor's \$4.600.600 (4 EO processor) with two O'Ch, 6456 layer	167
	and an		30°, 12, 17	inc made	-	-		18	64-136	3	×	1-40, 13-134, 16-179	CERTITION SEE	-	-	•	81.793.800 (3 (C) 81.803.800 (3 (C) 81.803.800 (3 (C) 9703.600 (3 (C)	p#
	Statement.	J== 1000	DP. SE. TP	Har sees	MP	87	NP	18	139 .	,	10	13-186. 34-176	C6/2 160 500	District	10	*	Provided to Substitute to Order 1988	37
	2270/1446	Jan 1980	SP. SE, 19	IIM 3000	MP	MP	NP	15		3	100	16-176	CB/1100 581	Disease	×	*	\$5.000,000 with few CPCs, \$400 byte 200 processor	107
	Vsae	Pel. 1800	SP.TP	ERM NOOES	10	NP.	NP		30-80	3	NP	36-64	MCP/VS	NA	NP.	60	State of the CPC.	107
	¥500,000	Nov. 1987. Aug. 1986	SP. 17	IIM 30005	M	100	NP	40	40-100	3	100	20-64	MORIVS	ма	307	-60	STATE SECTION AND ADDRESS OF SECTION ADDRESS OF SECTION AND ADDRESS OF SECTION AND ADDRESS OF SECTION AND ADDRESS OF SECTION ADDRESS OF SECTION ADDRESS OF SECTION AND ADDRESS OF SECTION ADDRESS OF	10

Few solid hits FROM PAGE 73

because for the first time it of-fers them a deaktop system that is compatible with the A series is compatible with the A series mainframe. The chip allows Un-isys to save development costs by building one chip and then modifying it for use in its other mainframe line. It demonstrated that capability with the an-nouncement of the System 80 Model 7E.

Model 7E.

In the meantime, Uninys in-troduced several other new sys-tems, including the A 12-B, which became the new entry point to its higher and A series processors. Unlike the previous entry point, the A 12-B will now w mers to field-upgrade to igger A series processors.
There was far less activity on

the part of Bull in the large-sys-tems market. One big step, how-ever, was the introduction and with them into the next year.

delivery of the DPS 9000, a new top-of-the-line system that re-portedly outperforms even the IBM 3090 when it comes to

IBM 3090 when it comes to transaction processing.

Initial reaction to the new ministrans was positive, although observers say Boll in still plagated by its ownership issue, which began when Honeywell sold off most of its stake in the company in late 1996.

Although this issue was cleared up this year, the evolving status of the company caused some users to feel unsertain about the company's future.

some users to feel uncertain about the company's future. For all the large-systems ven-dors, the last 12 months was a moderate success. But while most goals were met, none of the most goals were met, none of the wenders came through with fly-ing colors. They all struggled with a slowdown in demand, with some companies feeling that pinch more than others. And they will all take this challenge

How the charts work ed cost more than \$750,000.

category.
Where possible, the parameters used to group computer systems with their likely competitors were defined in the following manner:

o Medium-Scale systems normally support 17 to 128 us-ers and are priced in the \$100,000 to \$750,000 range.



Digital and Kodak are combining forces to provide high speed electronic printing for the Digital environment: the Kodak Ektaprint 1392 printer.

Direct Ethernet' connection...the first high speed PostScript' printer...high speeditive overhead system output printing. It's a powerful combination. As powerful as the combination of kodals 1932 printer and Digital Equipment Corporation's distributed printing architecture. Digital and Kodak are joining forces to provide seamless printing for the Digital environment. The Kodak Ekaparin 1932 printer's open architecture and software integration provide unequalled systems fleability. At up to 32 pages a minute, it can other print and staple a comprehe set does not be considered to the consideration.

Ask a Kodak representative for details on a 1392 printer integrated into your Digital environment. Or call 1800 255-3434. Est. 500

Now Digital has the Kodak advantage.

digital water

DIGITAL HAS IT NOW. PRINTERS BY WORK

Midsize vendors set new course

BY MARYFRAN IOHNSON

Caught between the devil of intelligent workstations and the uting, medium-scale systems ailed off in RISCy new direc-

saided our in KISA, new arrections this past year.

The demand for reduced instruction set computing (RISC)-based technology became a rising tide that even the giant of mediam-scale systems, Digital Equipment Corp., could no long-

MEDIUM-SCALE SYSTEMS

DEC made the biggest spisals among medium-scale vendors this past July by unveiling its RISC line of Decaystern \$400 and \$800 minicompaters along-side the latest models in the VMS-based VAS 6000 line. "People overfood DEC's ability to change what it's doing dramatically," says Bob Randolph, derector of program services for director of program services for director of program services for DEC's bispect vealences in DEC's bispect vealences or DEC's bispect vealences or DEC's bispect vealences or medium of the program services for DEC's bispect vealences or medium of the program services for DEC's bispect vealences or medium of the program services for the program s DEC's biggest weaknesses in 1968 was its lack of RISC prod-ucts. Now, a year later, it has a family of RISC processors. Not ny large companies can move

that fast."

IBM is expected to dive into double-architecture offerings in the near future with a family of RISC-based RT workstations that approaches medium-scale territory. Some analysts anticipate that the machines will offer support for up to 500 users.

Secret of my success
Beyond new or impending product introductions, the real success story this year was IBM's
Application System(400, considered by analysts to be the machine in
the computer gaint's history.

"The AS/400 is not an innovaries product but it was a sixty."

"the AS/400 is not an inno-vative product, but it was an ex-cellent marketing job," says John Logan, executive vice-pres-ident of the Aberdeen Group in Boston. "There were leaks on the product for nine months ahead of time, advisory councils aneau of time, advisory councils all over the place and advertising glitz around the world. I've nev-er seen anything done as well." The machine not only boost-

The machine not only boost-ed the middringe market overall, but it also allowed IBM to re-claim murket share lost to DEC and other minicomputer makers. In the space of six months, IBM increased its 27% share of the U.S. intermediate-systems market to 42% by the end of 1988, according to Phoenix-based mar-ket researcher Annex Research. DEC's share of medium-scale

shipments, however, fell from 45% in mid-1988 to 37% by year's end, the Annex figures competition from IBM fin the midrange] and HP and Sun in ons. They're lool "DEC is now facing tough

as are under pressure." an again, so are everybody "The bloom is off the



Since CA-IDEAL, More Than A Few Programmers Have Been Caught Speeding.

Put your programmers on the fast track, too. With CA-IDEAL® you get a proven, advanced application development system that eliminates tedious coding and allows you to start writing your business appli-cations right away. In over 1200 MVS, VSE and VM sites worldwide.

in over 1200 MVS, VSE and VM sites worktwise. CA-IDEAL has given programmers significant pro-ductivity and quality gains in developing industrial strength applications. It's helped thousands auto-mate everything from basic procedures to complex production systems critical to their operations. CA-IDEAL works with the world's leading relational

data bases: CA-DATACOM/DB and DB2. It includes a powerful procedural language, casy-to-use panel and report creation facilities, and intelligent color. All of which are fully managed by an active dictionary facility to support the complete application life cycle.

if you want proven speed and performance, cal larnie Brooks right now at 800-237-9273 (in N.)... 201.874-9000) and ask about CA-EDEAL. Then, ASSOCIATES once you get it, "Gentle-men, start your engines."

Medium-scale systems

VPHIOR.	MODECT	GAZE PREST PRETALLED	PRINCARY MARKETY	MOST COMPASABLE ISM OR DEC STETIM	PRINCIPAL DARRY	METORALACE (MITOPLY)	эмгинония	MACHINE CYCLE TIME (1984)	MEMORY EANOR (magebyres)	Disk TLANSFER BATT (magabyyte/sec.)	NUMBER OF PORTS	NUMBER OF CHANNELS	ОРЕБАТИМ SYSTEMS	SUPPORTS EMSENET OR TOKEN - EINE	MAXIMUM NUMBER OF USERS/ TYPICAL NUMBER OF USERS	WORD LENGTH (Ibin)	минес	незпантом
Aria Corp. 1980a 435-1300	Arte System 00 Market 40	PA. 1900	SP. CA, TI	107	43	**	70 DC	*	5-438	244	*	XP	Chile Systems V. Rationa 3.1	Ethernet	254/126	*	\$116,000 with 1656- late town dates, 20066- late days dates, 20066- lates days	CERT
	-	Pak. 1988	DP. CA. TI	107	*	M	71 DC	*	5418	244	Nº	HP	Unite System V. Robinso 3.5	Biome	E1360P	"	Size and was 5 CPUs, 16th type mesony. 15th type type from 700th type data	CRD4
AT&T (201) 221-2000	Motes	March 1980	77	MANAGE, DIEC 2000	NF	107	MP .	NP	8-272	7-18.8	24	KF	Unix System	-	406/150	22	SETS FOR WES CPUT, SME Sylve Coppe 13050 Sylve Coppe	End oper CRM, W
Corp. (201) 700-7000	3000E MPS	1500	DP, 52. TF	DEC VAX	13-72	NP.	HP	100	16-612	,	-	MA	celca	Distrect	013/000	22	Store and 1920- lyte memory	Sed year Older, Vil
	Monthes MA Months Ma	April 1980	SP. SL, TI	DOC WAX	13-36 648-36	NP .	NF	MP	800	,	32		Offess	District	130,04 254,00	н	\$1,04,000, \$360,000 with 1666-byte manney	Staf men Ottal, Vi
	3300 MPS	3900	SP. SL. TF	DOC VILE	64-35.5	HET.	12.1DC, 13-7212	100	9-130	3	. 03	2	cepan	Edwart	513/109	80	2300,000 with 1864	OBM, W
Control Date Corp. 1800: 565-2215	Cyber 932-31, 22	March 1967	DP. SE, TP	DRC VAZ DRCE, BM 4381, 9077	3.63. 7.30	CHC	181.75 DC. 6 64 LP. 6.80 LL	*	0-189	18-3	NP	8-17	MOSTAR	Ethernet	MP(25	и	\$137,400 C CPU, 604-	Entre
	Cyber 989-11 962-11	Chr. 1999	DP, SK, TP	DEC VAX 6000, Blod 6351, 3000	10.53	,	104.62 DC fortunate), 2.6 LP, 2.3 LL fortunal	11.3	64-254. 32-254	1.3-12	NP	24.52, 8-36	MON/YZ: MON, MON/GE (960-11)	torre	N7/65	64	STES,500 with CPU, 6454 byte manny, 8535,500	End user
Date General Corp. 1908 335-3430	167/13000 Model 10	7906	40	2000, SAX 6530	3007. 4500	44.45	3907, 4639 DE (satural)	60	38-64	247-6	612	2	ACRITE DUALIZ BETANDA	Blend	113/260	60	504,300-\$146,500 with 1456-byte manay, 66206-byte data	Sal sar OSM, V
	E-tper MY/15000 Model 00	1900	40	ESC VAX	7134	1.0	COLLF.	**	16-64	2.67-6	512	1	ACHVYS, DGAVS, ACHVETTED	Biteres	\$13/300		8341,100 with 1694- byte manary, 69234- byte data	CODA, TO
	E-tore 171/200000 Market 2	1900	*	DEC ANY	7.1		East.	*	18-64	20	1,000	,	ACRYS, DG/GE, ACRYSTEE	Prisonel	1,004/	80	\$321,000-\$421,500 with 1666-byte manney	COM. V
	Eclipse MY/40000	1900	A8	SEC ANY	14,875		18139 DE, 1 17, 711	50	33-100	27	1500	,	ACKATS. ACKATSE	Distant	1,054/	80	\$460,000 was 3000 byte manney	End wer CODE, VI
Digital Prosperson Corp. Commer band PSC make office	Walt 225	April 1100		NA.	2.8"	NP	NP .	80	23-256 (Yes), 32-138 (Union)	2.0	NP	NP	VMS. Uhris-30	Biterset	NA/ 60-130	80	\$160,800 (185va), \$160,120 (1900) with 2004 byte manney	End upor CEM, W
	Valx adop Media 306	Jan. 1900	All .	MA.	2.8*	NP.	HT	80	Some as above	2.5	Ю	NP	VMS. Librar-32	Ethernet	NU 50-225	32	\$155,200 (Lb/so), \$205,660 (YMS) with	End user. Olini, Vir
	Vall some Made 410	July 1500	All	MA .	7	NP .	10	29	Same to above	2.6	ж	XP	VMS, Librar-31	Etherset	NA/ 75-305	32	3(54 byte manery \$304,700 (Clare), \$229,000 (YMS) with 3256-byte manery	End unex OEM, Vie
- , -	VILT Seec Minde (20	July 1980	AB	MA	Up to 13	NP .	507	29	64-356 (VMS), 64-126 (UNIX)	2.60	MF	per	VMS. Ultran-30	Ethernet	125-000	22	S376,500 (Olera). S390,500 (Olera). S390,500 (Olera) with S4M-byte manary	Entition, Vic
	VALT 0000 Model 430	3dy 1900	14		Up to 19	NF		28	64-358	28	10	107	YMS	Educat	XA/ 250-660	ari ca	\$430,000 was 6404- lepte mannery, VMS	End war
	WALL SECTION Minchel 6400	July 1986	M			NP		28	128-254	2.90	эP	MP	Vacs	Edward	MA/ 200-800	80	\$627,000 web 12860- byte sensory, VMS	End war.
- 1	TAX 2000 Medici etio	34y 1909	*		Upto 31*	MP	NT	28	138 192	2.3	32	ST	VMS	Distrect	XA/ 235-900	22	\$700,000 wan 12866- byte memory, Y365	End user. CRIM, VA
	Secondani SE16	July 1000	=	MA	18.7	KP	NT	40	22-256	2.8	NP	NT	Uters 32	Ethernet	37/37	NP	\$69,000 web 3256 byte	East upor
	Deception SERP	107		MA	Up to 36	107	NP	40	64-256	26	XA.	NA.	Uhris-32	Dhered	NTSNT	NT .		COLUMN VAL
Sec. 147 Sec.	Manager 510	107	DF. SR. TP	MP	17-85	1.5- 17.5-00	NP .	**	20-60	1.3-10	100	NT	Union Systems	-	100+7	4	\$149,000 was 2204	End user, ORM
	Mar-190	NP .	SP. SS. 17	107		E3-85(b)	NP	*	30-166	3-36	1,000	NP	Char Spring	Bloom	1,000'	64		Statement.
	Consupt 30/00 Springs	-	SK.	DISC VALE	38.7	NP -	NP	n	£18	,	256	38	MPS-33	Ethernet	354/ 56-100	24	EDM. 600 mais file byte makery, 1200 myte earlie, CPU, dans finger date drives	East user, OEM
	Communic 32/9800.	100	=	M4 -	1-00	MF	107	13- 180	4-256	2.40	NF.	147	M75-32	these	XP;HP	22	\$1.40,000-0296,000 with CPU, 404-byte	Entrac.

"Some figures obtained from 1988. Companions with Hardware Resenting.
"Using Argentes Network Laboratory webers compliant technique and Adulfshirbly Again Microtrode.
"DP "Companion and plan processing 56"—a contrib/programmer; 17"—on-line transaction processing OA—of

*Affines of matractions per recent.

Yell-procuses milious of feneral point operations per second, 5—matament, P—peak.

The companies durished in this chart responded to a recent telephone are never telephone to a recent part of the companies and the chart responded to a recent telephone are recent telephone and the chart responded to a recent telephone are recent telephone are recent telephone and the chart responded to a recent telephone are recent telephone are recent to a recent telephone are recent to a recent t

MEDIUM	AND	SPECIAL-	PUKE	USE	2121	2.0

revenor .	шпост	OATH PRET INSTALLED	PRIMALE WARKET	MOST COMPAGABLISM OR DIC TYSTEM	НВОВИАНСЕДИРР)	PERFORMANCE (MILOPSY)	-xerrenceise	MACHINE CTCLEDIME (seed)	MEMORY RANGE (mageby/tes)	Cost/ordenes that the saturate age	NUMBER OF PORTS	NUMBER OF CHANNES	OFFICE STITING	SUPPORTS ETHERNET OR TOKEN SENS	MAXIMUM NUMBER OF USES/ TYPICAL MUMBER OF USERS	. (Hy) HUDSOTT GROW	Distribut	- мошления
714) 778-4000	GA 7999	May 1968	DP.TP	MA	HP.	707	100	150	432	3.5	1.89	129	Pet	Teles-Ring	126/46	33	E112,500 win CPU, 41056 byte date, dif- byte manney	Dage.
	GA 8800	March 1968	DF, TF	ж	MP	107	N* .	۳.	430	23	198	254	Pas	Yelson Hing	254/90	×	\$130,300 with land servence, \$30 data, \$56-	Dunber. TAX
Spoton Computer Spoton Civinia 200: 443-7747	HCT 2500	3dy 1907	DP. CA	DEC VAX 8530, BBH -		KP	SS44 DR Gertragii	100	14-64	3	64		CX/LX	Back	64/50	21	\$99,000 with CPU. 16M-byte manuary	CEM, Y
	HCX 2504	Jan. 1986	DP. OA, SE	DEC VAX 8530, 864 9330		107 -	11,575 DIE (across)	200	16-64	3	64	•	Same as above	Both	E28/300	22	2319 fée vin CPU. 1676 byle commery	Barl core DEX. Ye
	HCX 2900	May 1987	DP, OA, SE	DIEC VAX 9650, 000E	•	NF	11,575 DH (scree)	380	36-138	1.	254	39	Same as above	Bock	254/150	30	2345,000 with CPU, 16M byte memory	End use OEM, T
	E-800	Are: 1982	×	NP	1.58	62300	0.23 LP (ention)	180	7.64-12	2.4	128	31	WAL ST.	Edward .	120007	2046	\$364,000	CEM. V
	X-900 Ti-1000	Aug. 1987	SE .	NP NP	4.5	0.57 (3)	ESTUP (actual)	15	1,5-12	24	192	10	Same as above	Etheres	292(NP	32/48/ 64/76	\$360,000	DEM. V
	S-1100	Jan. 1964 Aug. 1967	88	NP	5	0.85 (2)	GAT LP (actual) GAS LP	75	1.5-12	2.4	90	31	Secretary	Ethernel	224/92	20,48/ 64/96 35,48/ 64/96	\$290,000	OEAL V
	E-1200	Jane 1000	2	NP	5	0.85 CD	E.ESLP (actual)	73	1,5-17	2.4	224	n	Sense as above	Etherest	234/107	54/76 22/48/ 54/96	\$200.000	COAC Y
	35-1200	Aug. 1967	58	NP	10	1.760	1.71.Pierted	75	1,572	24	200	50	Same as above	Ethernet	330/707	33,48F 64/96	\$555,000	Enf un
	El-1600	Sept. 1907	SE	NP .	15	2.65 (5)	2.55 LP	75	1.5-12	2.4	410	80	Same as above	Elbertet	416/90	33,48V 64,96	\$795,000	End und OEM. V
	Night Blank Medal 3800	April 1909	2	NP	540	NO.	6766-54,000 DM, 0.4-3.2 LP, 0.31-4 79 LL taxweD	50	294	,	160	27	CIVER. CIVER. CIVER.	Both	512/ 75-100	33	\$155,000 was CPC. 1655 byte cache	COOK.
	Migde Stants Minded 3400	April 1999	a	37	5-54	NP	6766-27.043 DBL 0.4-L6 LP, 0.31-2.36 LL Garrano	80	736	3	126	827	CKAT. CKAT	Bed	256/64	38	875,000 was CPU, 16K byte sicke	CEM.
Searywell Bull 817) 886-8000	CPS-8000(4)	Their	50,17	ISM 4391	×	10.	18 DC technol	м	16-128	107	NA	18	GCOSS	HP	N77300	36	Selected with CPU, 1684 byte manney	Radus
	CO'S scenima	There	DP. TP	204 3090. 4361	167	100	20 DC tartual	10	16-138	10	XA	10	GODSA	*	307)460	36	SETS,000 with CPU. 1636-byte manuary	End us
Sowieti-Peckard Co. 800) 753-0900 Desc. 292E	167-9000 Model 63558	Mey 1988	pr.se	BEC 1400	14	2.3	23 42 DR, 5.0 DC, 2 80 2.6 LP Getted)	44.	16-113	54	78	307	MD-CIX	Edward	124/ 22-96	32	\$161,550 with 2456 byte quantity, power matrix	Sept on
	167 9000 Mindel 650	Second quarter 1907	DP. SE. TP	DEC VAX	34.	164.00	7.0 DC, 1.33 LP (setse)	73	22-136	5	500	12th	MP-UX	Edgrant	300/150	32	\$164,500 with 1256 byte manney beliety backup, access port	DEM.
	167 9000 Model 655	Jane 1989	DP, SE, 19	1804 4381, 16C VAX 6330	11	22 GO. 22 GO.	31,720 DEL 0.6 DC, 2.2 LL (actual)	36	32-126	5	480	12	MP-UX	Etherset	406/180	32	\$306 500 with 3256- brie amoney, battery backup, access peri	DEM.
	107 9000 Model 935	Sept. 1986	DP, TP	BOM ASSAURE, DEC VAX 6320	1	507	12 DC ternal	67	68-96	NP	241		MPE XX.	BEZ.SLAN	346/NP	32	\$150 000 with 4886 byte researy, bulliny backup	End us VAR
	107 9000 Montal 1640	Sept. 1987	DP, TP	SIN ASSUME DEC VAX	,	MP	15 DC, Derhel	73	84-128	NP.	900	15	MEPE XX.	802.3 LAN	400/007	22	\$305 000 web 64M lete mesory, backey backers	Sed en
	157 9000 Model 955	May 1909	DP, TP .	26C VAX 6000, 19M 4381	tt.	MP	32 5 EC Octobell	80	54-192	NP	400	16	MPE XI.	802 3 LAN	400/07	32	\$465 000 web 5656 byte memory, becomy becken	Ead use VAR-
234 2001 042-0440	3099 Model 1065	March 1968	A	NA ·	165	100	107	18.5	23-264	5 -	100	14-32	MYS. VM. TPF. VSE	Both	HPHT	32	STREETE WILL CAN	NP
-	CIST Model	First counter 1801	DP. SE. TP	MA	ЖР	0.4T (P)	6.67 LP, 6.40	68	8-16	1	7	17	VMMPO. VMMA SP. MVMSPI mi	Beth	NP/NP	22	\$348,900	MP
	4301 Model 23***	First geneter 1891	Same or others	NA .	10	t.ST (5)	6.97 LP, 6.83	64	16-33	1	1	12 .	Samuel Samuel	Sec.	NP/MP	*	\$313,300	=
	430 Model	First quarter 1801	=	NA .	МР	1.81-1.7	REE.		18-64	1	2	19	VINCEUPO. VINCEUPO. MONOPO III I MONOPO III ESA	Beth	HP/NP	200	\$500,700	M
	6361 Model 34***	Post	Same in	MA	#	2.85	2.0°CP	52	16-64	1	1	26	YMANDO.	Bet	MPDOT	M2	\$857,760	100
	CSS Model	ises ises	HP	MA	NP	MP	13UP, 1.15	60	16-64	1	1	12	VILLED VILLED MYSOPT or VILLED VILLED MYSOPT or	307	NYM	NP .	E398,300 ·	HF
	COST 16444	Sept. 1000	DP, SR, TP	NA .	NP	131.	I Same I S	100	16-64	1	2	112	MANUAL AND	Deck	20100	32	5416,300	NP
٠.						1,500	Tiberit						YMETERO, YMETER ST. MYSERT IN 2 MYSERTO ESA					
	4301 Model 1002	HP.	NP	NA	MP	2.49************************************	2.8mm [.P	52	16-64	1	1	н	YMETA SP. MYSUSPI M I MYSUSPI	HP	NEW	*	8079,300	NP
	9977 Medal 66	**	*	MA	MA	HA.	6.0017	66.7	8-12	1	,	n	THATE THATE THATE THE THAT ACCUSED ACCUSED ACCUSED THATE	107	xoyae	*	\$140,500	×
	9977 Madel	NP.	307	NA .	NA.	NA.	GTELP.	52	B 16	1-	1	12	There is also	HP	1010	30 -	8368,600	107

HARDWARE ROUNDUP

	PROBUCT	CATT PRET BHSTALLED	PRINALSY MARKETY	MOST COMPARABLE ISM OR DEC STSTEM	PERFORMANCE (MEPSY)	PESTORMANIC HATLOREN	высничае	MACHINE CYCLE TIME (nsec)	MEMORY EANOR (magabytes)	DISK TRANSFER RATE (megabyte/sec.)	NUMBER OF PORTS	NUMBER OF CHANNELS	OPIEATING SYSTEMS	SUPPORTS THERMET OR TOKEN BING	MAXIMUM NUMBER OF USERS/ TYPICAL NUMBER OF USERS	мовр приоти физи	MARPIC	резинатион
Migo Computer System Sec. 10050 730-1700	Micros	Third garrier 1900	DP. SE	DEC WAX	20	107	161P. 67,400 DH (artisal)	48	30-128	1.5-20	144	NP	Date	307	30)50	22	\$216.000-\$125,000 with \$236 byte memor 3.6G byte dat, 13 sky	0004, 194
National Advanced Spaces (add: \$79-1000	ASJEX 10	First Ossilver 1900	DP. SE	BM 4383	4.7	NA.	MA	20	33-256	34	107	F-32	MYS YM. MYSSESAL MYSSESAL VM XA	NP	MANA	22	\$409.200	Endeser
	ASJEX 20	Second quarter 1967	DP, SE	1964 4381	6.3	NP	22 LP. 16 LL Dectail	20	32 256	3-6	SP	8-32	MYS. VM. MYSIESA MYSIEA VW XA	ХP	NUMBER	32	\$560,200	Enter
HCR Corp. (\$130 640-4100	Town 30/82	Second complex 1900	DP: OA	MP	NA.	107	NP	33	P-128	1.5	NP	NP	Crus System	Red	STOR	22	\$165 000 with 3256- type country, 2 FG- type data, 15004 type type	Cong. Vis.
	Town 2000	Pourth courter 1966	DP.CA	NP	ж	377	NP NP	23	5-384	1.5	NP	NP	Union Systems	Bed.	SUDINT	32	\$315,000 with 64M- byte namery, 4.8G- byte digh	Entimer. Olist Vil
a	V-0000 amin	NF	50,17	3000 CHIL.	1517	NP	NP .	38	164	1.5	18- 256	107	V92 .	lea .	NEWS	32	\$250,000-\$2,198,000 with 456 to 3256-byte stemary, 1-4 processors, 14-32	Sed year
	1000 17, 1004, 1004, 1043, 1641, 1621, 1621	NP	be: TF	800 ASPect, 9370, 4381	2.5	109	652350X 0x400	56- 145	4-190	1.5	3 136	100	VELUE	Reth .	KAKA	33	\$117,560-\$364,300	E / www
Maderi Computer Corp. (617) 890-3600	Terpre 35 Medab 50, 52	HP	DP, OA, SE		6.5-19.5 9-27		NP	MЪ	16-128	NP	NP	MF	Unit System	Etheran	167,002	22	\$82,000-\$446,966	End year
Print Computer, Inc. (See) 455-6000	4,000	May 1987	48	DRC sees, Stat 3000	11.8	NA	MA.	*	20-126	2.6	512	NA	PRIMOS	Ethernet	560/ 300-350	32	\$554,600 with 2254. byte manney, \$1716- byte dak, terminal	TAX
	6350	Aug. 1987	4	DBC 0300, sees, Blad 4301	1.5	ж	NA	*	33-44	2.4	512	NA.	PERMIS	Etherset	150-200	32	\$451,000 web 2004 lefte manager, 62,736 byte disk, terround	YAR
	4150	Aug. 1980	4	DEC STOR	11	ж	XX	4	22	2,4	256- 532	NA .	PERMOS	Ethernet	166-150	m	\$296,700 with 3294- leyte memory, 49636- leyte disk, territori	VAR
		744 1980	AS DP. OA	DEM ASSAGE	41	М	NA NP	77	24-32	24	254- 812	NA.	PRINCE	Plant	900/65- 75	30	\$161,600 wgs 2456- byte messay 45656- byte dak termed	TAR
	Princ 231. 1361, 1327	-		DIM 3046, DEC VAX SEES and SCOO	Up to 136	MP.		62.5	8-340	2.4	256	63	DYNCK 3.6	Phenet	300, 100	i	\$300,000, \$120,000	YAX YAX
Pyrounid Technology Corp. 14150 986-7300	MS-1, IE. 2. 4.12		DP, TP	DEC VAX BROG. GODE, BROG SOZIO	14-160	7.160 123(P)	47,000 [H. 3.8 LP, 4.2 LL (setsed)	190	8-256	2411	512	36	osz .	Ethernet	1,000/ 100-300	32	\$100,000 with \$256 byte manney, power neppton	CEM, Val
Posterio Inc. Spiritura Inc. Spiritura STOO	581	Sept. 1997	NP .	E54 3000	8-139	6.45 (P)	100 DC (mil) marmil), 5395 D61, 0.362 LP (milmal)	62.5	3-240	1.5	254	2:50	DINE	Ethernet	100-300	22	\$144,900 with 1634- layer memory, 2 CPU. 20430 byte date, 36 perio	Dalen. OEM. Sesion
Reguris Springs, Inc. (200) 400-4000	See 300	Feb. 1909	17	DEC VAX SECO	161	NO	20-64 DC Outsid)	MP	26	NP	1,900	26e	TOPIX	Edware	1,000/	NT	\$300,000	End-oner OEM. denter VALK
Strains Computer, Inc. (SDE) 400-9009	ZAMOO Maria 180 160	Jan. 1987	TP	1804 System 30	MA	NA	14-EF DC Servadi	62.5	***	2.45	***	•	WOS	Ethernt	HEFFER	20	\$170,000-\$756,000 with file to 3256 type memory, 1-6 processor	CODE, VAL
	ZAZONO Manua 70	Out. 1985	TP	Did System 60	MA	MA	18-12-DC factors)	62.5	8-16	245	112	1	Wis	Ethernet	MANAGE	32	\$110,000	End user, CRSM, WAR
Tanden Computers, Inc. 1000: 720-0000	Number CLX 720, 740, 760 760	2900	π	Didd ASyute	1.5-12	NP	NP	90 .	18-128	12	6-616	NP	Guardian 60	NP	6-816/ 54-300	33	\$105,000 with 2 CPUs, 16M byte messey, two 30056 lens disks, 12856 lens tape down	End user
- 171	VLENITE. 304E	April 1506	17	ERGE 4383	Up to 96	XX.	10	83.3	193-384	1316	NP	Up to 22	Counties 90	Ethernet	MINP	33	9540.000 was 1 CPUs. 16M-byte memory, 1,1 Colorte deb trass drive	End uppr
Onlers Corp. (215) 842-4013	Usess(79		DP. TP	ASHOR DEC VALT 6000	MT.	NP	307	100	8-80	3	96	MA	Usaya System V	Ethernet	200/ 86-120	36	\$110,000 with 1656 byle memory, 2 CPUs,	187
	Channelon	3dy 2900	DP. TP	ASSUME, ESPC VALX 6000	NP	NP	57	100		3	354	MA	Charge System V	Ethernet	400/100	32	\$196,000 with 1688- byte memory, 1 CPUs, lape, data	NP
	ALPEAD PLACET	Nev. 1900	DP. TF	Miss serre. ASpecto	NP.	NP .	107	167	13-48. 24-96	24,45	KA	1-94, 1-22	MCPIAS	Etherest	NEGOT	"	1195,000 with 1680- byte memory, 1 CPCs, tops, data 505,000 and \$115,000 (1256 byte memory, 1 CPCs, \$216,000 (2016- byte memory, 1 CPCs, \$216,000 (2016- byte memory, 1 CPCs)	N7
	A 128	March 1900	DP, TF	2004 4301	NP.	NP	NF	65	14-77	3	107	32-48	MCHAS	Ethernet	107/107	4		NP
	A16-DE, FE, 302	Sept. 1986	DP, TP	5004 4351. 3000	NT.	NP	NP.	73.5	13-54. 13-48. 34-98	,	MA	15-46. 25-80	MCPIAS	Etherset	NTINT	4	\$339,000 and \$464,000 (12M byte memory, 1 CPUS, \$776,000 GAM-	NP
	7311 Medel 2		10,17	Bibli 9379, ASHOR	NP	NT	57	136	10-26	3	MA	16-32	MC7/VS	MA	KPftGP	48	\$126,000 with 1066- tyle memory, CPU	ж
	1340	Nov. 1900	te.TF	IBM 9270, ASHROD	NP	KP	1	136	10-40	3	ж	14:32	MONT	NA .	107/507	40	\$205,000 with 1684	307
	V300	Out. 1989	be, TP	Blu SETA. Allywar	M	NP	МP	138	16-48	3	NA	24-64	MCHYS	NA .	HHHP	4	EXEC,000 with 1006- byte mannery, CPU	M

VEHICOR .	MODICE	DATT FREET INSTALLED	PERMARY MARKET	MOST COMMANAULINA OR DEC STETE	MESOSMANCO (MRPS)	PEFFORMANCELINFOPPY	- Javenovas	MACHINE CYCLE TIME (need)	MEMORY ELANDE (megabytes)	OUR TRANSFER BATT (magadytts/1004.)	MUNICIPAL OF PORTS	NUMBER OF CHAMPERS	OPERATING STATUME	SALE-METAL DE TOMBRET DE TOMBN. ESMO	MAXIMUM NUMBER OF USERS/ TYPICAL HUMBER OF USERS	MORE CROSSES (SAN)	DHARM	HOUMERLESS
Culora Corp. 22 To 543-4011	System 80 Models 10, 15, 20	July 1987, Oct. 1988 (Model 15)	DF. TP	TEM AQUADO, EXPE	MP .	KP	367	100, 100 Odube 20		22	NA .	14	OUS	Etherus	Nation	30	\$50,000 CDM-byte managery), \$150,000 and \$170,000 (656-byte stance); WCS CPU	167
	2300-381. 202	Dec. 1980	DF. 17	STRE ASSAUR. SISTE	10	107	NF	160	840		MA	1-39	OE/2300	Etherun	Habba	36	\$110,000,000 types memory 1 CPU1. \$174,000 table types memory, 2 CPU10 with	HP
	2300-003, 304	Oct. 1987	DP. TP	1984 A59400, 4381	MT	30	MP	108	-41	2	MA	1-09	06/1166	Ethernet	HERE	36	EDG2.000 CI CPUIG. EDD2.000 I4 CPUIG with Ref-layer manuary. Tan 200006-more disability.	HP
	2700-461, 403	March 2100	SP. TP	Milité étable Series (Mandal 680)	107	No.	NP .	*	16-64	3	MA	+41	06/1100	Steme	MOUNT	N.	SESSE DE CECTURA SESSE DES CECTURA però 1606 ligito	MP
	2304-401	Aug. 1989	DP, TP	3000 4351. 3000	HF	H		-	1644	1	XX.	461	06/1100	Elepan	HP/HP	×.	Selfs, self-th CPCAL Sess, sec-14 CPCAL with 18M-type	HT
Tang Laboratories, Inc. 1500: 459-5000	VS 10000, Models 50,75,500	Dec. 1986	DP.CA. TP	2004 4581. 3000	HF	MP .	100	"	23-254	,	107	30	VSOS, Diese	Ethernel	1,613/ 200-100	22	\$429,000 with 2005 light namedy	End the TAX

Midsize vendors

Corp. in Framingham, Mass., sees the Apolio division of HP and other firms garnibing on "open systems," while firms such as DEC, IBM and Unisys continue hedging their bets by offering both proprietary and RISC-based architectures.

For IPI and Apolio, the strategy seems to be pshying off. IPI's overall computer

too fee and reason. See a least of the see a see

Fighting the tide
Swimming against the RISC tide was
Wang Liboratories, fac., which hast February survised its high-end VS 10000 mile.
Mass.-based company expanded its proporietary VS product line with the VS000
machine, additional software and peripherals.
But severe financial troubles are
hunsting Wang, with losses last year of
\$424 million and sportle or thousands of
\$424 million and sportle or thousands.

Overall, the industry's product mix is shifting toward smaller, faster and cheap-er machines, so turning a profit gets tougher all the time, financial analyst Walker notes.

Rising inventories and falling demand for minis are plaguing companies such as Unisys, which last month announced staff cutbacks and a "top-to-bottom" opera-

"They're pushing products as fast as they can out the door, playing beat the clock," Walker says. These include a fifth Unix offering, in a deal with Sequent Computer Systems, Inc., and three new models of its U6000 series of Unix ma-

chines.

Tandem Computers, Inc. added four high-end models to its Noistop CLX 700 series of midrange on-line transaction processing (OLTP) systems. Ranging from two eight processors, the new models, priced from \$105,000 to \$405,000, present escalating competi-tion for DEC in the OLTP market.

service John, Person. Residently, conservices of the program of th

identity confusion turning into a market "It think minicoriuputers are becoming an endangered species," anys Bob Djurd-jevic, president of Annex Research. "The distinction between workstations and the midrange is beginning to blur." Djurdjevic's theory in that the spectac-ture tales of the ASA'do have temporarily propoped up a morehoud midrange market.

Armex Research put AS/400 shipments at 11,200 in the U.S., worth \$1.1 billion.

11,200 in the U.S., worth \$1.1 billion. Pent-up denimal for the long-awaited AS/400 was largely responsible for the enormous response: 25,000 shipped -three months after its August 1988 de-but. But it remains to be seen whether AS/400 installations will bring in much new business for IBM.

Dec deuxies
Other industry watchers see tangible signs of life among intermediate systems in DEC's diszying array of product roll-outs. The \$12.70 billson company unveiled three different generations of microprocessors during the past 16 months, feelsing out its 6000 services and adding through RISC competition for its own VAX

DEC makes no bones about its inte DEC makes no bones about its inten-tion to stay competitive among medium systems. The company spent millions this past aumner retraining a sales force con-fused about its strategy and product posi-tioning. Also, as IBM did two years ago, DEC is trimming overhead costs and shifting thousands of its employees from manufacturing positions to sales and ser-rent positions of sales and ser-

Nichael Geran, an industry analyst at Nikko Securities Co. International, Inc. in New York, sees a slowdown in market growth and conservative purchasing as key trends in the current medium-scale

market. Slower growth and movement toward safe-bet vendors, however, do not neces-sarily mean the market is either dying or

dull.

"I believe that as the market keeps changing, the mins will be used in different appears as severes or high-end machines connecting other machines, "says Adea Fairchild, as malyst at Dataquest, Inc. in San Jose, Calif." All those workstations and supercomputers in the world have to comect to something."

Memorable moments

December: IBM announces 25,000 Application System/400s have shipped. DEC confirms that the VAX 8600 will be phased out in

January: DEC announces its as-sault on the desktop, including the Decstation 3100, its first RISC-

April: IBM shows it will not give up on the 9370, offering a low-end 9370 and enhanced 9370 Model 50.

May: Wang's 2200 series, its origi-nal multiuser system, is turned out to pasture after 17 years and re-placed with a 386-based product line.

June: The AS/400 is 1 year old.

July: With the introduction of the 6000 series, DEC effectively re-places the 8000 series while ex-panding its RISC offerings. Unitys amounces plans to develop a Mo-torola, Inc. 68000-based server. Hewlett-Packard Co. amounces plans to license its RISC technology to other westors.

August: Wang hits the wall, as its ongoing fiscal woes result in a \$424.3 million loss in the fiscal year 1989 and the subsequent resignation of president Fred Wang.

Front ranks take heavy hits

BY GARY SMARY

The staff-designs industry has yet to re-Turb first version to accessive as co-tored Data Corp. is ETA Systems subsid-sion of the Corp. is ETA Systems subsid-ions of CDCs suscessed Cyber 200 effort and resistend the market with a increases with cyber properties. The co-efficient of the company is the co-stored company of the collection, the ETA deline show of these observer, some of the company in the rod cre-edystem of the company in the rod creed of the company in the rod creed of the company in the staff that the collection of the collection of the staff that the collection of the collection of the staff that the collection of the collection of the staff that the collection of the collection of the staff that the collection of the collection of the staff that the collection of the collection of the collection of the staff that the collection of the collection of the collection of the staff that the collection of the collection of the staff that the collection of the collection of the staff that the collection of the collection of the staff that the collection of the collection of the staff that the collection of the collection of the staff that the collection of the collection of the staff that the collection of the collection of the collection of the staff that the collection of the collection of the collection of the staff that the collection of the collection of the collection of the staff that the collection of the collection of the collection of the staff that the collection of the collection of the collection of the staff that the collection of the collection of the collection of the collection of the staff that the collection of the collection of the collection of the staff that the collection of the collection of the collecti

areau to cumanasa. In retrospect, the venture was proba-bly doomed from the outset. ETA had courted failure by attempting to pioneer too many technology frontiers at once. The ETA-10 design incorporated liquid nitrogen cooling, high-density custom CMOS circuits, multilayer printed-circuit

NDER PRESSURE to show early sales. ETA accepted contracts before the promised system software features were deliverable.

Lack of technological processes was not one of ETA's absort comings; it came close to achieving same of in Engris, Instead, to achieving same of in Engris, Instead, and achieving same of in Engris, Instead, challenges, such as Insic system design and onlyware development. The particular of the ETA's of after the less than popular CDC Cyber 205 succession preserves in ETA's of after the less than popular coursed speaks; and the superior of the control o

riser to Needham & Co., a Ne

ETA's fall merely served as a presuse to troubles deservhere in the industry. Barely a mosth later, grandfaddy Cray Research rocked the industry with its de-cision to cat loose its founder and industry garu. Seymour Cray, and his much her-abed Cray-3 development project. Many observers initially concluded that the soils was forced by a combination But this ill-fated effort merely stretched its already thin resources. ETA was sim-ply not able to support two operating sys-tems and did not choose between them. In the end, ETA did not fail for lack of capi-

not fail for lack of capi-tal or market potential; neither can its downfail be blamed on competitive pressures or in-ferior technology. Rather, key errors in strategic planning undermined an other-wise promising business plan.

that the split was forced by a combination of external pressures — namely, Japanese competition, Wall Street near-sight-edness and shortage of SPECIAL-PURPOSE research and de ment dollars. SYSTEMS behind the divorce can be traced to inter-nal causes. Differences between Cray's nagement and the company's name-te erupted over product strategy. This

unfortunate collision resulted from an earlier Cray Research decision to concur-rently fund two costly advanced develop-ment projects: the C-90 and the Cray-3. Cray Research initiated the C-90 pro-ject as an evolutionary path for produc-

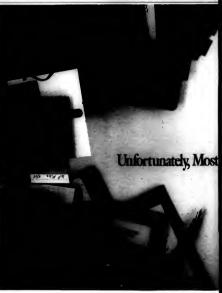
ject as an evolutionary path for production-oriented commercial users favoring the NY architecture. The Cry-3 was to be a breakthrough muchine designed to leverage off Cry-Research's research-oriented predescoso, the Cry-2.

At the start, Cry-Research's research-oriented predescoso, the Cry-2.

At the start, Cry-Research's research believed that the two projects would be separated in both chronology and permanec. Original plans called for the Cry-3 to reach the market at least two years alseed of the C-90.

But as both projects progressed, it

Continued on page 86



Superminis making moves behind the scenes

fuch of the action in the fast-evolving opercomputing industry in the past 12 conths has taken place in the boardrooms

OSE tails about the DEC 9000 are sketchy, but malysts say they be lieve the machines will ad-to-head with the Convex product

Loops and bounds
IDC figures show worldwide revenues for
the high-performance mainframe market
growing from 84.5 billion in 1988 to 85.8
billion in 1983, supercomputers
growing from 8425 million last year to
31.3 billion in '933, and minisuper tonputers are increasing it a whopping compoand namel growth rate of 36%, growing from 8251 million last year to \$1.19
billion by '83.

proceed man in growth in the offering sur-ging the 1521 million in the year to \$1.12. But Goddieb believes the minimage composition category. Believe the composition category is first from them such as fillent or forwards of first from them such as fillent Graphics Conference for the composition of first from them such as fillent Graphics for the composition of first from them such as fillent Graphics for the composition of first from them such as fillent Graphics for Graphics for

be achieve only a most been vectored.

Thinking Machines itself attempt capture a wider audience by introducated-down versions of the Conne Machine. The CM-2A machines, ava in 4,092- and 8,192-processor mor are priced at \$500,000 and slightly a

are priced at \$500,000 and sightly more than \$1 million, respectively.

Ministopers are often characterised by purallel processing architectures. But many analysis were there may be an unique priced processing on the straining for search trying to percompaging the search straining the search straining

though be admits that computibility issues may surface when users begin trying to move between levels of parallelism.

Booker is Comp

ONEDOLLAR

Organizations Don't Manage The Assets On The Left As Carefully As This One.

Because the lifeblood of any organization is the flow of money, that's where automation is always applied first. You already know about financial automation.

first. You already know about financial automation. It's brought you the control you need to manage more effectively, and compete more profitably. But this is the Information Age: And in it infor-mation, whether it's passed as text or images or raw data, is the currency of competitive survival. If you've not managing it with as much critical attention as your financies, your ability no compete is creding so your financies, your ability no compete is creding

every day.

You need to take the next crucial step.

Jou need RASSW the established standard for

RASS was developed by Information Dimensions

a subsidiary of Bartels, to enable organizations like

ours to manage ald of your information Dimensions

a subsidiary of Bartels, to enable organizations like

ours to manage ald of your information more

saft graphs; RASS allows you to input in various

formati, including word processing like, scanned

documents and images.

Just as important is your ability to pinpoint the

information you need when you need it. Aid here IAASS bring you advanced conners based entered. IAASS bring you advanced conners based entered. IAASS bring you advanced conners based entered. IAASS bring you want to be a second to

HARDWARE ROUNDUP

Front ranks CONTINUED FROM PAGE 64

came clear that the paths were con-rging on the same target. Development ags caused the Cray-3 program to slip are than a year behind schedule, while

on the horns search had unwittingly created a narketing dilemma. The company ding two virtually identical proens, targeting the same price poi rformance range, customer set and such date. The situation was both costly

rocess, management concluded that the roubled Cray-3 project would have to go. The divorce settlement reached between the two parties was probably the least damaging option available. With its one-time payment, which provides the new Cray Computer Corp. with roughly \$150 million in cash and assets to com-

Plete its first working prototype, Cray Research avoided a potentially bitter breakup. After that, Seymour Cray's new wenture will be on its own.

The departure of the company's founder, while crippling, will not be fatal to Cray Research. Over the years, the

company brought in dozens of top-notch engineers and designers. Given this depth, the company will be able to weath-er Seymour Cray's departure much bet-

ter than it could have in its early years. Cray Research is well-entrenched in a loval installed base. The company has an array of competitive products to carry it to the next generation. The company's new flagship product line, the Y-MP, has

been well received But the recent catharsis has tak toll. In 1989, Cray Research will likely post a decline in sales and earnings for the first time in its 13-year history, Single-

digit growth may be the best it can bone next year. Little is known about plans for Sey-our Cray's new venture, Cray Computer. It is a fact that the Cray-3 development is now at least a year behind schedule, but Seymour Cray remains con-fident that a working prototype of the process or module assembly will be opera-

onal by year's end.
The Crav-3 design incorporates al out 50,000 logic chips to achieve peak rformance of about 16 hillion floatingint operations per second - eight to

10 times faster than the Cray-2.

The greatest challenge for the new machine is manufacturability. The Cray-3 and its follow-one will depend on manufacand its follow-one was depend on manurac-turing technology so advanced that most of the assembly equipment will have to be either heavily modified or designed from

Cray is expected to hand-assemble a few Cray-3 preproduction prototypes in 1990. These will likely be smaller, fourprocessor configurations for internal and sophisticated government use.

If the machine lives up to its billing,

If the machine lives up to its beling, Seymour Cray may have doness of loyal followers standing in line to buy one, and Cray Research could be the loser. By ear-ty 1990, Cray Research will be at full stride with its Y-MP product line, the survivability of the next wave of upstarts will be more apparent, the Japanese will have revealed their new offering, and ETA will

Win a free trip to Communication Networks '90

And get all the details on America's premier communications conference just by entering

And get all the details on America's premis New Televans, and our own materials will be given in bandungs. It is not a final to our materials will be given in bandungs. It is present to the present of the premise of the first and Communication in New York (1997) and the Pills stand Communication in New York (1997) and the Pills stand Communication in New York (1997) and the Pills stand Communication will be present and Communication will be present and the Pills stand Communication products and errors. Communication will be present and the Pills will be present the present and the Pills will be present the present the present and the Pills will be present the pres

Just send in the form to enter.

rase enter sty name in your Communic at and send me full details about the co in. I understand I must fill in this form.

When you complete and return the form below, we'll sake sure you get complete details on Communication Net-orius 30 as they become available. AND, we'll automatically siter you in our contest for one of these three prizes:

er you in our connex, nor one of times three pruses.

1. Free air first, hotel and conference admission. As First.

Prits winner you will get round-trip airfare from your nearest major simport, three admission to three days of conferences and the exposition, plus your choice of one daylong, in depth tutorial. Approximate total value \$1,976.

long, in output uniorae. Approximate total vance signifi-cal Pres accommodations and conference admission. Second Prits winner will receive three nights accomme dations at the Grand Hyatt, plus one in-depth tutorial and free admission to the full conference and expositis Approximate total value: \$1,375. ONTEST ..

Rest ___ ZP ___

3. Free conference admission. Third prize, valued at \$895, includes your choice of one day long, in-depth tutorial and full conference and exposition

There's no way you can lose!

Whether you win a prize or not, you win. You will get information on a conference and exposition that can give you the expertise you need to stay ahead of your competitors. Send in the form today, or FAX it to 508-872-8237.

Summary of Contest Rules

Entry Form must be filled out with all infe Entry Form must be fifted out with all information requested and revered at the address shown NO LAZES TRANS. respected and reverse at the address shown NO LAZES TRANS. The respective of the property of the

For a copy of the complete contest rules, or a list of winner send a self-addressed stamped envelope to Communication Net-works '90, P.O. Box 9171, Framingham, MA 01701.



Washington, D.C. • February 5-8, 1990											
N	T	R	Y		F	0	R	H			
List	the five	comme	micatio	ns/ne	tworki	ng topics	un whic	h you ar			
L.											
2											
1 _											

When filled in com Communication Networks Contest P.O. Box 9171, Framingham, MA 01701-9171

COMPUTERWORLD

Superminis CONTINUED FROM PAGE 85

minisuper vindors. IDC estimates that they will account for 13% of the \$9 billion workholds high-performance computer workholds high-performance computer tions have been trimmed for the projected market for high-performance market for high-performance market for sigh-performance market may be smaller market for \$25 million supercomputers. Analysis note that the breath of \$25 million supercomputers in relatively finite in size. "Hingorean suggests. He sdds, however, that he does not think the market for soft surraced.

Japanese companies seem to agree that there is room to expand into the U.S. marketplace. Analysis note that Japanese players Hitachi Ltd., NEC Corp. and Fuplayers Histohi Ltd., NEC Corp., and Pu-litus Ltd., will continue to seek a foothold in the U.S. The Japanese have demon-strated steady improvements in hard-ware, and a number of analysts say it is only a matter of time before they improve their software skills.

Analyst Canin believes that the Japa

Analyst Cenin believes that the Japanese are, for our, strapting only to opclobion of the supercomputer market. "For the next two to there perus." Japanese two to the proper super suppliers will be nonexistent, claim says. He notes, however, that, the distinction between miningers and under the control of the control of

ond-tier minisupercomputer players will have the stamina for the future. What the demise of ETA Systems and the splitting

demise of ETA Systems and the aphities of Crays indisarts be says, in this "the foot of R&D) investment continues to accelerate, and there is some question whether the smaller players can compete." The ministage companies, facing the Japanese on the one hard and high-end workstations on the other, have a brief window of opportunity. Jake superconstructions are supportunity to the property of the

Special-purpose systems

ENDOR	PRODUCT	DATE PRST INSTALLED	PRIMARY MADKET	MOST COMPARABLE IBM OR DEC SYSTEM	PERFORMANCE (MIPST)	PERFORMANCE (MR.OFS?)	BENCHMARK	MACHINE CYCLE TIME (need)	MEMORY EANOF (megabytes	DISK TRANSFER RATE (megolyte/sec.)	NUMBER OF PORTS	NUMBER OF CHANNELS	OPERATING SYSTEMS	SUPPORTS ETHERNET OR TOKEN-RING	MAXIMUM NUMBER OF USERS/ TYPICAL NUMBER OF USERS	мове шмотн (ын)	BASE PRICE	різтірвитіон
Uliant Computer Systems Corp. NOS: 486-4950	FX/60	May 1985	Œ	DEC VAX 8800, IBM 3090	NP	32.6 (S). 54.4 (F)	S.3-6.6 LP (actual)	176	125	NP	16- 128	•	Ueix	Ethernet	32	64	\$149,000	Enduser, OEM
206) 486-4950	FX/80	May 1985	æ	DEC VAX BROO, IBM 3090	MP	70 (S), 188.8 (P)	B.S-10,9 LP (actual)	170	254	NP	Same	12	Ueix	Ethernet	64	64	\$259,000 .	Some as above
	FX/82	May 1985	SE	DRC VAX BROO, BIM 3090	NP	377.6(P) .	NP	170	512	NP	3.	24	Unix	Dhereet	128	4	\$1,250,000	Same as above
	VFX/40	Sept. 1988	SE	DEC VAX 8800, UM 3290	NP	32.6 (S). 64.4 (P)	5.3-6.8 LP (actual)	170	328	NP	-	6	Unin	Ethernet	32	64	£300,000	Some as above
	VFX/80	Sept. 1988	58	DEC VAX 8800, DM	NP.	70(S), -188.8(P)	8.5-10.9 LP (school)	170	254	кр	Some M above	12	Unix	Ethernet.	64	4	\$350,000	Some as above
Coover Computer 214) 497-4000	C210-C240	Sept.	SE	IBM 3090- 2006, VF	56-224	44-164 (S). 50-200 (F)	18-50 LP	40	64-2000	24	NF	NF	Unix	Ethernet	532/ 100	64	\$300,000	End user.
Cray Research, Inc. 8001 234-3401	Crey Y-MP	Nov. 1988	SE	NA .	NP		195-262 LP (actual)	•	128-1024	9.6	78	18	Unicos, COS	Ethernet	NP/ 1,000	4 .	\$23,700,000 with 12656 byte memory, 48 data parts, 16 tape channels	Ent user. OEM
Evans & Sutherland Computer Div. 415) 963-1295	ES-1 Super- computer Series	Fourth quarter rest	SE	MP	1600	1600 (P)	1320 LP. 164 LL (enterate)	40 -	256-2048	12	MP	16-64	ESIX	Ethernet	1,400	4	\$2,200,000 with 256M byte marriery, tape drive	End user
Pleating Point Systems, Inc. 303) 641-3151	FFS M64/168	1961	SZ	EF2M 3090	21	642 (S) 1173 (P)	7.55 LP. 5.5 LL (noticented)	52.6	6-128		MP	•	SE	Ethernet	NP	4	\$370,000 with BM leyton mannery	
	FFS 5800	ЖP	æ	ж	NP	36-45 (E) 48-102 (P)	NP.	41.7	10	Up to	MP	NP	Proprietacy	NP	1/MP	35/64	M	NP.
	Midrage Seper- computer Model 500	Feb. 1, 1900	æ	TRM 3000	133	150 (S), 167 (P)	24.2 LP, 5.2 LL (actual)	30	16M-1G	6	2	•	FFE (Unit System V, Release 3)	Etherset	128/64 128	66	\$190,000 web 1636 byte memory, 2 \$40 ports	Carl user, CARSAL, VAL
	Super- computer Model 200	May 1988	SE	NP	35	60 (S), 60 (P)	10.5LP (actual)	50 .	256	24	XA	•	Stellis	Ethernet	100/36	612	62 06,700 with 3254 byte mannery, 15004-byte tape drive, consells, 4 ports	OEM
Multiflew Computer, Isc. (203) 488-6090	7/200. 7/300, 14/300, 28/300	Jan. 1987	SE	NP	53-215	22-69 (S), 30-120 (P)	9-201P. 4.2-61L (actual)	130	32-512	26	96	2	Trace/Clair, RSD 4.3	Dherret	56/64	NP.	\$299,500	End wer
Sharebase Corp. 406; 378-7000	Server/ 8000	1968	AS	NA	NA	NA	NA	NA .	16-256	3	6-48	6	Relational Database Operating System	Ethernet	30P) 1,000	32	\$363,000-\$548,000 with 1656 byte memory, 2G-byte disk. Simulson II software	End user. CIESA
	Server/100	1981	Dr. of	NA .	NA.	NA	NA	NA .		3	4-54	1-7	Relational Database Operating System	Etherset	NP1 100+	16	\$195,000-\$290,000 with \$34-byte memory, \$6-byte disk, Sharebase I seltware	End nor. OEM
	Server/300	1985	AI	NA -	NA .	NA	MA	NA	•	1.8	3-32	14	Relational Distallance Operating System	Ethernet	NP/90	16	\$45,000-\$136,000 with 6M-byte mannery, \$2006-byte date, Starvisser 1 software	End user, DEM, VA
Thinking Machines Corp. 1617) 676-1111	Connection Machine CM-2	Aug. 1987	SE	NA	2500	4660 (S), 14,000 (F)	NP	NP	12894-20	100	NP	NP	UniqUhris	Ethernet	NP	NP	16K 32K 64K	End user
	Connection Machine CM-2A	June 1986	SE	NA '	2500	4000 (S). 14,000 (P)	MP	NP .	12894-20	100	NP	NP	.UasqUbris	Etherret	NP	NP_	\$500,000 with 4K-, 8K byte CPUs	Enil user
Terodata Corp. (312) 827-8777	DRC/1012 Data Base Computer	Dec. 1984	DP TP	EN 3000	8000	NP	1174 TPS (actual)	50	6-6000	2	1500	1-500	905	Ethernet	100+) 16-56	32	\$1,700,000- \$2,000,000 with 22 CPUs	Enter

TP - Commercial data processing: SE - scientific/regionering: TP - co-line transaction processing: OA - office extremts

Y as precious malous of Examing-point operations per second: S -mantained: T - peak.
The second performance ratings, based on the following industry standard benchmarks: DM - Disystoner Version 1.1 (people)s optimization only); DC - Debu/Credit (transactions based on 95% unbaccand response

The companies included in this chart responded to a recent telephone survey conducted by Computerworld. When a vendor is unable to provide specific information about its product. the abbreviation NP (not provided) is used. When a question does not apply to a weeker's revoluct: the abbreviation NP (not provided) is used. Further accelerate information about its product.

SEPTEMBER 18, 1989 COMPUTERWORLD

If you'd expect to pay more for AT&T Digital Services, expect a surprise.

Everyone knows that AT&T ACCUNET* Digital Services offer the highest quality But until now, you worried about paying a higher price. Your worries are over.

We've just made dramatic cuts in the prices of our family of ACCUNET Digital Services. No matter what size or type of business you're in, now ATAT has a digital service that's right.

at a price that's right on the money.

First, we're introducing rate cuts of up to 34% on TL5 and up to 40% on TA5, depending on mileage. Which means, on a month-to-month basis, AT&T costs less than those so-called "bargain" carriers for a typical circuit.

Next, our Multi-Service Volume Pricing Han adds significant volume discounts to those reduced prices. And if you use more than one of our digital services, you can now combine revenue volumes for DDS, T15, T45, International ACCUNET Digital Services* and ACCUNET Spectrum of Digital Services. You can even move from service to service as your needs change with no penalty. Try to find volume discounts like that with any other carrier.

There's more. Now we offer term discounts on T15 and T45 that enable you to purchase one to five years worth of service at additional savings of up to 24% off the month-to-month price.

If these discounts sound like good reasons to look into All'A digital services, here's yet another reason to act quickly Through December 18, ATEI util until util nonrecurring charges, even on office multiplexing, when you purchase T15 or T45 with an interoffice charmlet circuit.*

And remember if information is critical to your business, AT&T quality is something you can't afford to be without. We have the largest fiber network, more digital route miles and the greatest redundancy of any carrier. Plus AT&T offers T15 users a comprehensive Network Management program to help ensure trouble-free service.

Get the best quality service at the best possible price. Call your AT&T Account Executive or 1800 222-0400 to find out how much our new discounts can save your business.



IN DEPTH

Slaying the IS dragon with outsourcery

The service bureau approach to DP makes a comeback - with a twist

BY ALAN G.

hamman and the control of the contro

agenesis.

Gradually, but with increas
ing certainty, some of these excentrives are concluding that the
promised productivity, which
was their reason for investing is
information technology in the
first place, will not materials
unless forster. measures are tall
exto the certain construction of their
first place, will not materials
unless forster. measures are tall
exto the certain construction
of many constructions of their
first place, will
dervei BMs has entered the outcertaint models.

Outsourcing is being serious by considered in more and mor organizations as a potential soli tion to rising IS costs. An I manager who anticipates the need for a budget increase whose organization fits the de acciption of a good candidate fo outsourcing would do well to the control of the control of the outsourcing would do well to the control of the control of the outsourcing would do well to the control of the contr

Hammerumith, a principal at A. T. Kearney, Inc. in its New York office, or sults with executives on improving the effectiveness of information systems of study the financial and organ tional benefits of adopting

ing are considerable and on timerease. Requirements to a vice large amounts of debt himade every department the seject of intense cost reduction. Also, competitive pressure fir around the world in creating a structuring of business and comanding the integration of pr

These external pressures combining with powerful int nal pressures to create ra change. Companies are qu

tired of spending millions hardware and software that me be obsolete the next year. The crease not convinced that they a making the best use of exists detured to the convinced that they are mixing the best use of exists duties. The convinced that they are that they have the right equament or people.

Eurthermore, many IS orgamisstions are having trouble keeping up with the pace of tech nological change. It is difficult to acquire, maintain and afford th highly skilled people required is today's mainframe computer of erations. The pressures of rean already raging fire.

Outsourcing can help ease
these problems in several ways.

In the past, outsourcing wa
available in the form of such specialty applications as payroll, in
surance processing, credit cardand mailing lists and wis offeror

Today, however, the outsourcing of not only specialty applications but also entire IS functions in becoming increasing

> The most recent increase in service bureau-type activity has occurred in data center outsourcing, in which in-house data



HARK STEELS

Giving up control of the nitty-gritty details

When cost-cutting gets overwhelming

Aiding migrations, mergers and acquisitions

ry operations, and the mainframes computer service company. Some se in activity has also occurred in cilities management arena. Facilin management arena.

n management is a type of outso
which a firm takes over on-site m
set of a data center. The outsou t or a data center. The outsourcer in case brings in some of its own people keeps some of the client's staff, and it stains the data center as it is set up at

the customer location.

As indicated, much of what is fanning the fire for the return to outsourcing is that business is having to restructure to

remain competitive.

Assuming this, it is necessary that IS mow — and support — what restructuring entails. Understanding today's busi-

ns environment is a prerequisite to de-loping tomorrow's vision. IS executives to do not understand their company's ness cannot keep pace with the ses in their business environment ness environment nor can they create the changes needed

or can they create the changes needed uring the restructuring process. The two critical factors for successful estructuring are a willingness to recast be business processes in such a way that sey are integrated and performed for the interprise as a whole and an understanding that computer technology can be used to enable, not hinder, the changing pros. One task cannot be accor est the other

Data center outsourcing alone cannot solve these problems, but it can provide IS some time to focus on the business is-

sues. By outsourcing day-to-day opera-tions, the IS organization hands over re-sponsibility for the nitty-gritty details and

spossibility for the nitty-gritty details and thus gains at least some time to keep pace with the changing business environment. The IS organization is a business with-in a business and should be run like a busi-ness. Effort should be spent on tasks ben-cicial to the business; therefore, the structuring of priorities is critical. Out-

sourcing may become one way of restruc-turing IS priorities.

Contributing factors There are other factors that contribute to the growing use of outsourcing. Although the combination of factors may differ from company to company, the primary moti-vation is most often the pressure to re-

duce cost. The major cost-oriented fac-tors include the following:

Increasing costs of mainframe en-vironments. The hardware, software

vironments. The nardware, souware and staffing costs required to operate a mainframe organization are becoming more expensive and attracting senior ent's attention. Large outlays for capital and expenses are being more

o Profit pressures. Reduced profits and the pressure to cut costs are causing man-agement to look everywhere to increase margins. The IS function is no longer offimits to severe cost-cutting attacks.

Higher level IS executives. Many companies now have senior executives managing the IS function. These execu-

tives most often run their operations as a business instead of as a data processing shop, and this view opens up alternatives

— such as outsourcing — not previously accepted by information systems. The IS outsourcing decision has thus become an acceptable alternative.

• Increased debt. Leveraged buyout activity, and its large debt structure, has been a major reason for cutting costs in

the IS area, thus supporting the use of outsourcing when costs can be reduced. Mergers and acquisitions. Out-sourcing has been effectively used to cre-ate a temporary home for the computer

Who's offering it?



Boeing Computer Services Vienna, Va.

cial Tec tilly, Va. 31-4313

mation No s, Texas 80-1006 rork Corp

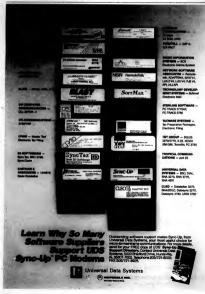
May & Speh, Inc. Downers Grove, III. 312-964-1501

McDonnell Do New York, N.Y 212-267-8000 neit, USA

New York, N.Y. 212-750-6100 Sungard Compu Philadelphia, Pa. 215-351-1300

.................

STEEL ...



until a plan can be de away from the acquired con

els are difficult and exretain. Outsourcing firms have the expertise that IS is

d reasons to outfears associated with putds of outsid s stem from a lack of expee and knowledge of the out-ing business. Some major

e will lose control." Anny IS executives express concern that they are giving up con-trol when considering a move to an outsourcing facility. In fact, however, control can increase when IS personnel are better to concentrate on issues with greater returns. In many cases, few IS executives even want to return to their own data center operation after using a re-

e computer service. "They do not know our m with data center outoplications; the outse ust runs the data center. Also, ally hire your people, who do

ey are not sensitive to business," "hile this could be true, experienced data outsourcing firms are ly well-equipped to be re-sive, and it is in their interest to be sensitive to your busi ss. In many cases, they will be able to respond to urgent situa-tions faster than a limited instaff could. Further, as the trend moves from primarily data outsourcing to other forms, there will be more and more specialization, depend

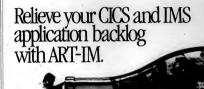
eration is complete. A comr migration can be like a rental car parking lot with long spikes at the entrance — once you're half-way in, you can't ack out without some damage. ations can be complicated that require careful plan-

also play a significant role outsourcing decision

COMPUTER MIGRATION can be like a rental car parking lot with ong spikes at the entrance - once you're half-way in, you can't back out without some damage.

ness situations in which out-sourcing could be a boon include the following:

company. Certainly, an invest-ment in computers should not be made if the financial health of



If you're like most CICS or IMS shors, you're probably spending 80% of your time and expenses on maintaining existing programs. Which makes it virtually impossible to meet increasing user demands. As a result, you've got an enormous application backlog. Now Inference can help you address it with

ART-IM." the Automated Reasoning Tool for Information Management. ART-IM is a powerful tool for de veloping applications in MVS, CXCS, IMS, MS-DOS and OS/2. Its impressive rule

based and object-oriented programming offer vast advances over procedural pro grams in solving everyday problems. Dramatically reduce

your maintenance expense.

Frequent changes in business pol icies and procedures can turn your software applications (e.g., payroll) into spaghetti code. Modifications become difficult and testing becomes time-consuming. Your applications cannot keep pace with your business.

With ART-IM, however, your business policies can be directly represented as software business rules - each independent of the other. For instance, you can represent one business rule with one

ART-IM rule Unlike procedural programs, rules ean be added, deleted and modifiedindependently of any other rules in the application. A change in policy maps directly to a change in the software statement that represents it.

Extend user functionality By capturing the knowledge and

experience of your best decision makers. your ART-IM application becomes a reservoir for the company's expertise and its evolving policies and procedures. You can then make this invaluable information available on-line to your entire

What's been the impact on end sers? A new level of functionality never before available for making consistent and accurate decisions.

A long track record of successful customers.

Ten years of technology refinement has made Inference a leader in the industry. We've helped many companies successfully implement production expert system solutions. Our practical building block approach allows us to

offer an extensive range of knowledge based products and professional services depending on your needs and resources

Today, our customers are using ART-IM to cut maintenance efforts dramatically. In addition, many are reporting ten-fold improvements in development productivity.

So if your applications backlog has created an enormous bottleneck in your productivity. ART-IM can help you find your way out. For contplete inform call Chris Dow at (213) 417-7997 Or write Inference Corp.,

5300 W. Century Blvd Los Angeles, CA 90045. .

Inferen c

The Expert System Experts"

the an experience registered and life and life of the second of the contract Register Cosp Mil. Color and the second contract of the cost of the cost

r what the r

ware were the most ideal users of outsourcing. But the size of the companies involved in this trend is changing; certainly when a facilities managemen deal is struck between Eastman Kodak Co. and IBM (CW, July

31] it's time to take notice.

Today, both centralized and nies — and

more than \$1 billion — have opt-ed successfully for outsourcing. There are other situations in IS, not always cris when good business

computer Building a new data cer solidating data centers, upgrad-ing to new hardware, buying

are all lacy uses to solve a seconomical of outsourcing.

• You have acquired a new company. If you do not have the capacity to assume the computing responsibility of your acquisition or there is not time to do so, the outsourcing alternative might be considered. Using an outsourcing firm provides time to plan a strategy for the orderly assimilation of the acquisition. A brute-force, move-ti-over migration — with its over migration — with its inherent problems, costs and dis-ruptions — may not be a reason-able alternative.

 You are moving away from a corporate data center. One company had a central data center shared by several sister comone or more of the con was important to move them out of the central data center. The company found that outsourcing was an excellent alternative for the time period before the sale.

Don't do it! There are, of course, situation in which outsourcing does not make sense. It should not be considered the panacea to solve all IS problems. Some situations that do not lend them outsourcing include min

ous our ting menuse minicomput-er environments and multiven-dor integrated environments. Minicomputers seldom have the high expenses associated with mainframe computers and therefore are not good few, if any, remote co services have offerings w ital Equipment Cor Computer, Inc., Hev and Co. or other min

altivendor environment pe of facility could, ho outsourced on a fa-

The use of outsourcing and e outsourcing industry today bear many similarities to the ser-vice-bureau and time-sharing work of the 1960s and '70s. In



Save Half Your Ribbon Budget with Ribbon Saver* Systems! Why waste supply dollars? Install Printronix-

approved Ribbon Saver systems and replenish ribbon ink during high speed printing. You'll save 50% of your ribbon budget and get superior print quality plus high bar code scan rates too.

Ribbon Saver

brackets install in 5 minutes. Replacement ink rollers slip on in seconds. No mess. No Printronix warranty problems. Ribbon Saver systems are built into many OEM cartridge ribbons too. Contact your ribbon distributor or call Poreion,

Inc., 1480 Gould Drive, Cookeville, TN 38501, (615) 432-4032.

By Porelon

© 1985 French Inc. Million Service a prepared valences of Foreign Inc., Coolerelle TX

8 Steps

There are eight basic steps infor-mation systems executives should take when considering whether /-

e when considering whether to with outsourcing tesp 1. Have a current systems hincture plan. This is developed in the objectives of your enter-tiopation of top mesagement. tesp 2. List the pros and cons of sourcing. Using your systems hitchare plan and a thorough ferstanding of your enterprise, nitly the issues, advantages and obstacles of contourcing your

cess.

tep 3. Understand your current
planned IS costs. These costs
uid cover a minimum of three
ra, with specific emphasis on any
or expenses IS expects to incur-

rs, was specific emphasis on any or expenses IS expects to incur-tin that period. tep 4. Starting with computer rations, prepare a detailed de-ption of your environment. Insuch items as hardware con-stion, direct-access storage

cal processing periods, coppat voice, and control of the control o

spleted.

Negotiste a contract.

et vendors are flexible and will
optiste contract issues. It is intunt to identify all the issues un

nt covered in the confract. Deding on your particular situst, this can be a long list.

ALANG. HAMMERSMITH

mand. Many of these vendors will be large companies offering time on their congusiers; however, be careful when using usch firms because outsourcing internal IS is sometimes a questionable business ventre that distract from the mission of the companies' internal IS function. It is one situation in which using internal IS to external competitive advantage or profit may not be desirable. In any case, many of these new vendors will fall by the wayside



Managing DASD Performance Can Be a Pleasure Trip... Not a Survival Course



DASDMON will revolutionize the way you manage MVS DASD performance.

Traditional DASD tuning techniques are being outpaced by faster CPUs and increasing user demands for more online data. Although cache controllers, data spaces and hiperspaces will relieve some of the strain, they also create new complexities. Tuning DASD can feel like struggling through a survival course.

DASDMON takes you away from it all

DASDMON offers you system managed performance today. By cutting through the complexities of conventional tuning, managing DASD performance is more automatic and streamlined than ever before. Once you've set response time objectives, just sit back and...

- DASDMON will identify problems by continually measuring individual I/O response times and comparing them to your objectives.
- DASDMON will determine the cause of problems by gathering and analyzing data. No longer will you spend hours scanning reports.
- DASDMON will present solutions to your problems in precise English, and simulate their effects to ensure that a new problem is not introduced.

 DASDMON will select the best possible set of solutions so you can implement recommendations with confidence.

And, if you have any questions or concerns along the way, our experienced technical support staff will be glad to guide you—24 hours a day.

To maximize your system's overall performance, use DASDMON with our DASD Performance Optimizers. These products eliminate DASD I/Os, resulting in automatic response time reduction.

automatic response time reduction.

For more details, call (800) 323-2600 or (412) 323-2600 in Pennsylvania.

Performance and Optimization products from LEGENT.
Enjoy the results.

IECENT

The company formed by the merger of Duquesne Systems and Morino.

Two Allegheny Center Pittsburgh, PA 15212

COMPUTER INDUSTRY

NDUSTRY

Nell Margolis

What's in a name?

Lots, say a raft of consul-tants. So many of them have sa

it for so long, in fact, that some of them have started up lucrative

ve companies.

Lots, echo the scores of us-



LONGMONT, Colo. — Hints of "material financial irregular-ities" at disk drive maker Mini-scribe Corp. erupted last week into findings of alleged runaway fraud as an investigative com-mittee a report called into seri-cus question the company's abili-ty to maintain its credibility. Its customers, its investors and, ul-Granted, it's an old whine — but in new battles.
The advent of Stardent Com-

justry: to wit, what's in a corpo-

Fraud alleged at Miniscribe

BY NELL MARGOLIS and JEAN S. BOZMAN

LONGMONT, Colo. - Hints of

tens — the transwork sup-posedly erected to screen or smoke out the sort of wrongdo-ing that apparently found fertile breeding ground at Miniscribe

during the administration of for-mer Chairman and Chief Execu-tive Officer Q.T. Wiles. Neither Wiles nor any other Miniscribe staffers were specifi-cally named as having participat-

Synoptics rides to top of wiring niche market

BY CHARLES VON SIMSON

of them have started up nacrative businesses addressing nothing but this question and supply carefully strategized names to companies willing to pay big bucks to ensure that they make the correct first impression. Lots, say an even larger raft MOUNTAIN VIEW, Calif. of computer company execu-tives who, over the years, have MOUNTAIN VIEW, Calf.—
The basic technology does not come from a Paio Alto garage but from Kerox Corp, research laboratories. The product does not pash out the envelope of the information age but rather thrives in the stude beneath the boom in local-area networking. The company's officers are not wide-cyed kids but veterans of confided the anguish they've gone through trying to arrive st the right name for their respec-

Lots, echo the scores of us-ers (or would-be users) who have confided over the years their anguish at not being able to re-member companies' names — or, worse still, their embarrassent st naving to inter some or con-Lots, said the last Compu-recent documnist who ad-esseed the topic. She was driv-Continued on jugar 100 are growth rate in 1986 — its first year as a publicly held con-first year as a publicly held con-

with in sight.
The pitch to IS is that net The pitch to IS is that net-work nodes can be connected more efficiently and cheaply over unshielded twinted-pair — the standard telephone wiring often already in place in buildings



— than over the coaxial cables currently used for the job. In addition, the company has developed an icco-driven network, musagement system for this layer of connectivity that has wo early praise from users. The firm increased its initialed base from 18,000 to 125,000 network modes in 1986 alone.

bie," said N. J. Tripode, network tnanager at Arco Oil and Gos Co-in Dallas. "But the substantial cost eavings in installation and

came out of a developm ject at Xerox's Palo A search Center (PARC

Coming attraction: Info's new look

BY RICHARD PASTORE

Women in bitainis. Grab bags. Magicians pailing Macs out of hats. In the past, such gimmicias may have lured attendees to ven-dor exhibits and helped vivify the overall trade show. However, his approach is no longer mough. Producers of shows such as Info — a 16-year-old agers — retains that they must coax money- and time-strapped uners and buyers back by giving them what they really need — pc. inent information. "What we've done is take a

ood hard look at the Info now," said Kerry Gumas, vice-



COMPUTERWORLD

their technology interests,

Miniscribe

ereport," maid Gerald F. Hallaren, Mir-niès i director of strategic planning, eyond that, we don't know what y've doing about this. They're proba-still reading the report. "The full re-still reading the report." The full re-re is at the cost in a special property of the Mary McCoe, a spokesworms for the curries and Exchange Commission, that SEC policy problate either con-ning or denying that an SEC investiga-io in progress. "If and when any viola-ning of derivative size is found, we

[will] file a lawsuit," she said.

Whatever the eventual legalities and wherever they fall, the greatest violation

servers — the integrity of the current slate of Miniscribe executives and their orts to concentrate on new products reconstituted finances, he nevertheand a positive prognosis unlikely.

verything they say is suspect now."

d. "This is a fast-moving business;

he said. "This is a fast-moving business; why should anyone take a chance with a company that's let this kind of thing hap-pen?" The disk-drive niche, Ossad noted, is spolling for a shakeout. Given a wide range of choices, he said, "Why should anyone take their chances buying from Miniscribe or investing in them?"

hose identity the com y reaction to last week's revelations.
"We're still using them," said a snoke-

man for Compag Computer Corp., who declined to confirm to what extent. At Apple Computer, Inc. — identified by Miniscribe as a 20M-byte hard disk

by Miniscribe as a 20M-byte hard disk customer—a spokesswama declined to confirm or desy the relationship. "I think they [Miniscribe] have a chance to pull through," said Robert Kai-riev, vice-president of Disk! Trend, Inc., a market research firm in Mountain View, Calif. "They have to do everything right now. They can't make any more mis-takes."

IN BRIEF

Right On Mitch Kaper's On Techn Inc. tapped two Lotus De most Corp. veterans for

Chip set suit

And so it goes

The high road

The high route
Compaq Computer Corp. has increased its Scottish presence by
135,000 square feet with last
work's purchase of Wang Labora-

WHEN THE STAKES ARE HIGH, CHOOSE SUPERIOR TECHNOLOGY



LATTISNET SYSTEM 3000



Synoptics FROM PAGE 95

critics contend that today's fan cy box is tomorrow's dime-a dozen, made-in-Japan widget, leading the company that relies on it into a bleak backwater where basic manufacturing wins where basic manufacturing was the day and margins shrivel to nothing. Even in the face of breakneck growth, a number of Wall Street analysts have dis-missed Synoptics' long-term prospects and continue to short

Mony advantages
Ludwick, however, sees the
company as having a number of
unique advantages that will belp
the companyity fate. amque advantages that was being t avoid the commodity fate. Even with the growth we have "Even with the growth we have had, we do not view this business as bulletproot," Ludwick said. "Over the long term, new pressures will appear. We are confi-dent that we can stay ahead." New products, too, will ap-pear. Currently under develop-

ment is a line of concentrators that will deliver IBM's Token-Ring network protocol over twisted-pair wiring and ultimate-ly deliver Fiber Distributed Data

Interface capabilities.

"This is the classic Silicon Valley story," said George Kelley, network analyst at Goldman Sachs & Co. "A company becomes a market leader in a siche and stays far enough ahead of the potential competition that it isn't worth their while to enter the market." Kelley said that Synoptics is forward on unnorthing Tomarket." Kelley said that Synop-tics is focused on supporting To-ken-Ring and Ethernet over un-shielded twisted-pair in a way that IBM cannot be, simply be-cause it can support but will nev-er endorse Ethernet.
"The debate is whether we

Memos to tell Wang news

LOWELL, Mass. - Whatever else befalls employees at embat-tied Wang Laboratories, Inc., none of them will be subjected to the indignity of having the morn-ing paper tell them that they are out of work. And they've got it in writing, as a promise from the

In a memo issued last week, recently appointed Wang Presi-dent Richard Miller confirmed dent Richard Maler contirmed that the company was expedi-tiously pursuing its ongoing ef-fort to reduce staff by as many as 25,000 jobs. However, he dis-missed the prospect of as many as 10,000 layoffs in as few as as 10,000 tayons in as rew as nine months — a figure attribut-ed to analysts' projections in at least one local newspaper as "wild speculation."

Wang employees, the Miller memo said, will be the first to be told of any new payroll pruning.

can bring new technology to market faster than competitors can force margins down," Lud-wick said. "Our track record

It is an in It is an impressive record. The company has logged triple-digit growth almost since it was founded. San Jose, Calif-based market research firm Dataquest currently estimates that the

stantly with 12% and other syers, including IBM and Un-rman-Bass, Inc., supply 19%.

But even among customers, here is a view that physical con-

110 users in its Dallan headquar-ters office. At the same time, however, the company went with a Token-Ring product from though Synoptics has ng product in devel-

KELLY COMPUTER WE GET PROFESSIONALS IOB DONE



3Com profits ease concerns

New poison pill plan effectively forms barrier to takeover

BY PATRICIA KEEFE

SANTA CLARA, Calif. - There is noth-SANTA CLARA, Calif. — There is noth-ing like a significant drop in stock valua-tion to make a company start looking ner-vously over its shoulder. On the other hand, a profitable quarter, especially if the outcome was in doubt, can help boust in-

stor confidence.
It has been a frustrating summer for stwork supplier 3Com Corp., which used itself faced with both situations.
But after giving Wall Street the willies and we are eliminating it." said William

in Job by surring of a possible loss in its first fiscal quarter ended Aug. 31, 3Com confirmed as profitable quarter last week, are expected to hit approximately 300 million, resulting in sales of about \$50 million, in June, 3Com had predicted first-quarter revenues of about \$100 million and \$50 million, in June, 3Com had predicted first-quarter revenues of about \$100 million \$50 million, \$100 million, \$1

Krause, 3Com's chairman and chief exec-utive officer.

utive officer.

The reason the potential of a loss — which one 3Com insider said was highly unlikely at the time — was mentioned in the first place was to cover all possible options for the querter, Krause said. "We didn't want to have to ever do another press release (on the quarter)," he spinned. "It's much better to get all the negative news out and reset expectations.

Then you demonstrate with good performance that everything is okay, and there's no reason to be such worry

As of last Thursday, 3Com's stock had bounced back up to a healthier 13%. Seesawing forecasts for the quarter are not solely responsible for either the

downward turn in 3Com stock prices or the subsequent correction. The impact of competitors' price slashing, turmoil in the distribution channels and a slow product cycle helped 3Com stock plasmmet from a high of 28% in May to barely 11 points in

ngm of 20% in May to burely 11 points in August.

However, the network supplier has not been sitting idly by while a miffed Wall Street downgraded its stock to levels dan-gerously enticing in this crazed era of

percently entirent in the crased era of beyond, seed, No. Com revoled a phenomen of the control of the control

s barrier to anyone intent on taking over 3Com by tossing HP into the picture. It also protects HP's investment in 3Com, which, according to the companies' current agreement, could rise to 10%.

Computerworld

Reprints from Computerworld provide a valuable marketing/sales tool for your company!

Editorial articles are available as reprints and can be ordered in various quantities, and customized to include your company loga and sales affices. Whether you wish to have reprints of an article written specifically about your company or a subject of general interest, these reprints* can be a great resource for use in:

■ Promotional/P.R. materials ■ Internal meetings ■ Company seminars

Produced in a minimum quantities of 500 for black-and-white and two color reprints; 1,000 for four-color reprints.

For complete information on ardering reprints contact: Shoron Bryant Reprints Department Computerworld 375 Cochituate Road

Framingham, MA 01701-9171 Tel. 508-879-0700



COMPUTERWORLD

The newspaper for information systems management

Phoenix posts another loss

BY RICHARD PASTORE

NORWOOD, Mass. - Phoenix Technol-NORWOOD, Man. — Phoenix Technologies Lid. will have to postpone its rise from the askes for another quarter. The company confirmed analyst estimates last week that it will post a \$7 million fourth quarter loss and \$2.8 million loss for the year ended Sept. 30.

The had tidings are the latenche pass in and out of the chief executive officier's office it past four months, a \$1 million loss that the seen Lance Hausche pass in and out of the chief executive officer's office it past four months, a \$1 million loss that starter are \$2.5 work force reduc-

last quarter and a 23% work force reduc-tion since May.

tion since May.

Acting CEO Theodore Joseph, wi predicted that Phoenix will return to pro-itability during the second half of 199

itability during the second half of 1990, also amounced new cost-cutting enamers. Most significant is the southing of a Pleenin's University program since Son Microsystems, Inc.'s Scalable Processor Architecture workstation market. "It's far more difficult a task to bely support Unix than would meet the eye," said David Bayer, an analyst at Mostgomery Southlies in Sur Francisco. "It doesn't lend itself as much to standardia-tion as was orientally envisioned by this tools are was orientally envisioned by this

docent' tend stell as much to standardiza-tion as was originally envisioned by this and other companies."

Bruce Crane, Phoenix's director of in-westor relations, confirmed that no fur-ther layoffs were intended. He refused to divulge specific loss estimates, but said that the analystal projections were "in the neighborhood."

Today's DisplayWrite. Word processing that works for you on many different levels.

The word processing standard, company-wide. And worldwide. IBM DisplayWri

word processing can handle any job, at any level, from one end of your company to the other. Which is why DisplayWrite is a standard from one end

of the Fortune 1000 to the other. The DisplayWrite family covers everything from basic text editing to text-and-graphics design. So no matter how fast you grow, you won't outgrow DisplayWrite.

For DOS, DisplayWrite writes a whole new chapter. DisplayWrite 4 Version 2?* the most powerful DOS version ever, now gives une most powerful DUS version ever, now gives you convenient pulldown menus, and easily handles multicolumn text. It works with more than 60 printer models, IBM and non-IBM than 00 printer models, 1898 and non-1890 alike. There's even a free user support footline. The powerful spell-checker uses multiple distincaries in one pass, a timesaving DisplayWrite exclusive. There are optional dictionaries for legal/modical terms and 17 foreign languages. DisplayWrite also works with 1B90 mainframe hosts and LAN environments, including the new IBM OfficeVision/2 LAN series.

DisplayWrite and the power

of OS/2. For OS/2" users, DisplayWrite 5/2 has all the features above, and more. You can multitask, to work on multiple documents simultaneously. Choose easy menus or speedy fast-path commands. Consult online help screens anytime. And the optional Composer Extension adds sophisticated graph ics and page layout features.

To get on the DisplayWrite stan-dard (or discover how most current. DisplayWrite users can upgrade for under \$100), call your IBM Author-ized Dealer, IBM marketing repre-sentative or 1 800 IBM-2468,

Let today's DisplayWrite take you written communications to the high est level yet.







Margolis CONTINUED FROM PAGE 95

en to it by the birth, attended by no small amount of fanfare, of a company whose name no one could prenounce. It was BIIN. Can you say BIIN? Here's a hint: It's an acrosym. Do you know what the letters stand

Okay, next question: Can you say Apple? Was it not, in fact, probably one of the first words you could say, as you eagerly reached for one? Did you ever eagerly bite into a BIIN? I rest

getty tote into a Billy? I rest y case. Following a few basic round rules would eliminate me of the most misbegotten mes in this industry, which in

of consultancy fees, both before the birth and after the christening, when customers are having a hard time figuring out who they are and what they do:

If it has more than three letters and doesn't spell a word.

don't use it. · A corollary to the above rule A coronary to the above rule:
 If you have to spell out the words in order to get people to re-member the initials, you've de-

feated your ourpose: don't use

it.

If you have to explain it in parentheses, don't use it.

If parentheses don't go far enough and you have to explain it in a mailing, don't even think it.

If people will remember it for the wrong reasons, don't use it.

Stardent is the brainchild of Ardent Computer Corp.'s Allen Michels and Stellar Computer

Inc.'s John William Poduska— two industry names to be reck-oned with for real. They came up with Star-dent, we're told, in the spirit of equality — a true medding of their merging companies' names. (Arguably, the only such melding within the realm of possibility; just try saying Stei-dent or Ardiar out loud.) Now, the spirit of equality is some-thing not to be taken lightly. Unte, or maybe sugarless g

Admit it: "Vine out of 10 family dentists recommend Stardent" sounds strangely familiar. Names, of course, aren't ev-erything. Technology, manage-ment, marketing, distribution and a whopping done of luck still count for something, even in the most cynical of circles. However, Stardent is start-tion cast in few with some verious out in life with some seriour

tacles to overcome OLLOWING A few basic ground rules would eliminate some of the most misbegotten names in this industry. which in turn would save companies a lot of consultancy fees, both before the birth and after the christening.

"The firm is aimed at a tricky, limited and hotly contested mar-ket. It's headed by a duo so dy-namic that analysts coast to ability to accommodate each other or's co-tenancy in the execu-tive suite, even on an interim be-sis. It's beading out to do buttle in the computer industry. In the global murketplace. In 1989. Up against factors like these, one would think a compuny could use a start with its best

its foot in its mouth. On the positive side, or mented one seasoned industry observer, "I think naming the company Stardent was a gutsy act; it demonstrates a lot of confidence to choose a silly

And when you get right down to it, maybe it isn't so silly after all. As a lot of companies and their investors are finding out the hard way, there's a 5-nite number of people with both cophisticated graphics super-compating needs and the mega-bocks budgets to inchige them. On the other hand, everybody has teeth

Tom Barnes got away from it a

Because the INFO Show has it all.

PCs. mints, software, LANs, micro to mainframe links, electronic publishing, communications and more....In or code, around the strength of the

Unlike narrow-focus shows, INFO lets you take in all technologies at one time. In one place. That's important in this rapidly changing industry, where you must keep up with a multitude of possibilities.

At INFO, you can discuss alternative strategies with hundreds of vendors. Their guidance will demonstrate to you how INFO serves as a full-scale resource-your gateway to integrating solutions.

For Conference information or a program - call 1-800-255-7798. In Connecticut, call (203) 964-8287. October 10-13, 1989

Jacob K. Javits Convention Center New York, NY

of this ad.

(\$99 covers 35 sessions)

that has it all

In addition to expanded Software and Computer Security Sections, this year's INFO introduces a new section—Presentation Products. And at our four-day Conference, top experts will update you on the most

challenging information technology issues for a minimal investment

Take advantage of our discount offer to visit INFO '89. It's the show

SPECIAL DISCOUNT OFFER-SAVE \$15!

Tear out this entire ad and bring it to INFO '89. With this ad, you pay only \$10. (Regular registration fee, \$25.)

For additional discount registrations, bring photocopies



COMPUTERWORLD

P.O. Box 2044 Marion, Ohio 43306-2144





NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

.....

BUSINESS REPLY MAIL
FIRST CLASS PIRMET NO 55 MARION, OH 43306
POSTAGE WILL BE PRID BY ADDRESSIE

COMPUTERWORLD

P.O. Box 2044 Marion, Ohio 43306-2144



YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of \$44.00° per year — a savings of 57% off the single copy price. In addition, I'll receive special bonus sections of COMPUTERWORLD Focus on Integration.

Time Company
Address

Address shown Charte Caumess Charter Charter Caumess Charter C

COMPUTERWORLD



"CU NOW, MR 1, 1989 TO TORSON WAR COMPATENESSES 1 SWITCH STORD TO GIT THE WALL THING AT CHES."

YES, I want to recover my own copy of COMPATTERNONLE each week 1 accept your offer of \$44.00" per year — a savings of \$17% off the single copy price in addition, I'll receive special bonus sections of COMPATERNOPILD Flocus on Integration.

Froi Name M Lan Marre

City State Zg

Address shown □ Home □ Business □ New □ Remer Basic Rate: \$48 per year

Address shown in norm in susuress in the incident of the right to qualify for this special or incident of the right to qualify for this special or incident or

COMPUTERWORLD

E400AX

Per Manageria de Manageria Seriores y de Computer Burnos To

THUS PURCHOSE (THE OWN IN THE STATE OF MANAGEMENT THE 15 Year PROMOTE THE 15 Year May Super 15 SANTON Surveys 12 Dr. May Super 15 SANTON Surveys 12 Dr. May Super 16 SANTON Surveys 12 Dr. May Super 16 Tepparamong 12 Dr. May Super 16 Tepparamong 12 Programma Verbicum Navoyal 88 Dr. May Super 16 SANTON SUPER 16 Date 15 Dr. May Super 16 SANTON SUPER 16 Date 15 Dr. May Super 16 Dr. May S

Financia Officia MACI Tash No.

F4RYA X



"THE GARTNER GROUP HAS LOST THE FOLLOWING EXECUTIVES IN THE LAST 24 MONTHS...

2 - 1 - 1

- Executive . = Finance! In-
- Vice President Software Matieum in the
- Vice Presidents 2 Enteroris, N=Nvi + 13=
- Strategies in Telecommunications or
- Wide President Local Area Commun.
 Wide President Community Published
- Vice President

 Vice President

WHAT DO THEY
KNOW ABOUT
THE COMPANY
THAT YOU
DON'T?"

CHARLES C. GRECO PRESIDENT IDC FINANCIAL SERVICES CORPORATION

MIS Solutions for The 90's

TECHNOLOGY INVESTMENT STRATEGIES

A Product of IDC Financial Services Corporation

FOR MORE INFORMATION CONTACT TERRI LeBLANC (508) 872-8200

COMPUTER CAREERS

Before joining a troubled firm

Size up the company's management and business, along with yourself

BY JOHN J. DAVIS



th's the tele-phone call you've fantasized about. It sounds like a dream job — hefty salary, ex-ent perks and benefits, pow-autonomy and an industry know like the back of your Do not expect to walk into a situ-ation like this and come out un-

you know like the back of your hund. The cavest is that the com-pany is in trouble. Its earnings have been falling at a precipitous rate for three years. It is strug-ging to hold its markets is the face of intense competition, for-ing a 10% staff reduction. To make matters worse, two hungy conglowerstes are win-biling at its beets, waiting for the right removed in numer.

e to accept it — is to turn e information systems func-n around. It is quite a decision, the one hand, the job sounds morous and exciting; on the rousette with your career.

It is hard to turn your back on
a 25% boost in pay — maybe
50%, if you are successful — not
to mention perks and benefits
that you may not find at a healthy

company.

What should you do? What factors should you consider to help you make your decision? A

a Can you tolerate massive doses of risk? You are jumping into the fire: Are you willing to be singed by the flames? Do not be naive.

thed. This situation is not for the battle-shy. It is for someone who enjoys a good fight, who envi-sions himself a survivor, a winsions himself a survivor, a war-ner. You are going to be working in a high-stress covernment and it will spill over into your personal life. And more likely n not, you will be doing most of the grunt work yourself Are you willing to work long hours? Forget about working conventional 9:00 to 5:00 days.

It is more likely that your work days will begin before 8:00 and end whenever. Weekends? Count on giving up many Sutur-days. Travel? You guessed it. The bigger the company, the more travel you can expect. If you are not pacifying employees you are not pacifying employees in another part of the country, you could be negotiating with hardware and software suppli-ers, managers and fellow execu-tives from here to Zimbabwe.

What would those tasks do to your family life? Wreak havoc. spending an exorbitant amount Are you an analytical problem-solver or a nuts-and-bolts person of money, or does the entire line have to be scrapped and over-

who needs direction? Troubled ies do not need more soldiers. Most are already bur-dened with them. They need innovative thinkers who relish tackling tough problems. The

Now take a hard look at the company from these strategic age points: · How aggressive is the manage-

HIS SITUATION is not for the battle-shy. It is for someone who enjoys a good fight. who envisions himself a survivor, a winner. You are going to be working in a highstress environment, and it will spill over into

ment? Is it conservative and unwilling to make bold atrategic leaps? If so, you may be up against a brick wall, making your iob all the more difficult and your tenuous. Management should be ready to stand behind you and support you

LEXIS"

your personal life.

 How strong is the product line? Is it excellent or marginal? More importantly, is it salvageable? Can it be improved without

indicating a precipitous, unre-coverable loss, you could be facing the prospect of beating a dead horse. With all the information in front of you — preferably on pa-

per — the decision-making pro-cess should be straightforward. Put the risks on one side, the re-wards on the other. Which are greater? You have your answer. Crisis situations are a marvel-ous opportunity to show what you can do and prove that you are a superstar. The risks are

hauled? If there is no hope of a turnaround within a reasonable amount of time, joining the com-pany may be the wrong move to make. The same rationale applies if the company provides a

service.

a How strong are the company's markets, and where are they? Is the company perishing in all the markets or just losing its share in some of them? How much market erosion has there been in the post few years Networking and approach officials of the company directly can provide enough information

to draw your own conclusions. If the market decline is enormous

high, the stakes are formidable you could lose your shirt. On the flip side, a victory could catapul fip side, a victory could catepul, your career to a new plateau, strengthening your bargaining position. If you see yourself as a budding chief information offi-cer, a troubled company is a ready-made battlefield on which to show were mettle

Silver linings Furthermore, you could win

ven if things do not work out for e company and it crumbles. Unless you are the chief exect Unless you are the chief execu-tive officer, no one would consid-er it a strike against you. When searching for a new position, se-nior executives will admire your courage and think of you as a clutch player, someone who can

take the heat.

Individualists stand the best chance of thriving in a troubled company. In contrast to tradithey relish the opportunity to rewrite the rules to sut their purposes. Should you decide to acco

such a position, do not ask for an employment contract when negotiating the initial terms of ement. You are unproven and could do more harm than good. instrate what you can do first and then ask for a contract Once you have proven yourself, you are in an excellent position to make realistic demands Davis is president of John J. Davis & As-

soriates Inc., a New York-based execu tive search from specializers in informa-

SIEMENS

VAX/VMS Software Engineer

nts should have a BS or MS in E E , Co and Engineering and should be aspend in the VAX/VMS environment. Program

Siemens Medical Systems, Inc. 186 Wood Avenue South Isalin, NJ 08830

Manager

Data Center Operations Mead Data Central may be your oppose tunity to fulfil your professional goals and objectives by managing a shift in one of

the targest and most sophishcates Date
Centers in the area. This position is located. ivring areas in the country The successful candidate will possess a

computer operators management exper-sence in an IBM mainframe environment. with demonstrated skills in applications software disaster recovery vendor regota-tion and budget planning Data Center Facility and felecommunications exper-

Mead Data Central provides challenge, recognition professional growth and devel ment. We provide a smoke free enuman ment along with a companies corregings ton and benefits package To schedule a local interview, send it

desume and salary hetory in confidence to N: A.L Dove

NEXIS

TELON and DB2 TRAINING

CW Systems inc., is a leading consulting firm specializing in custom software development projects using the littlest software engineering techniques on challenging environments. If you have preven stiffle in one of the following ar-eas and would like to learn TELON and DEZ-please call and/or send your resume to one of the addresses below:

· A 4 GL LANGUAGE

· RELATIONAL DATABASÉ APP. CODE GENERATOR

CW Systems Inc.



tielsen Media Research, a company of the Dun & Bradstreet Corporation, s the leading supplier of marketing seaarch information for the televi-

SYSTEMS PROGRAMMER Tampa Bay Location

Computer Science and two or me years of systems programming exp rience on large scale IMh hardware a VM/MVS environment. You will be responsible for installing

You will be responsible for installing tuning, debugging and maintaining complex systems software such YMMTAD, VMIXA, VM Center III at 18th Contesting author constant utilities.

Extensive communications with so ware vendors and training of interusers requires exceptional oral a written communication skills.

tams software, NSM, ACF2, BAI tams software, NSM, ACF2, BAI Easytrieve and PL/1 will be an asset. Located near the Gulf of Mexico, w offer a salary commensurate with experience, excellent benefits. n

state income taxes, a \$25,000 homstand exemption and beautiful yearound weather. For interestate and confidential corsideration, please send a current re

Department CW 918, 375 Patricia Ave., Dunedin, Ft. 34698. An Equal Opportunity Employer MFN/M. Nictseri Medica Research

United Data Services, Inc.

Due to our continuing growth, we have a variety of data processing positions evalable. If you're a top-noton professional and can answer yes to the following questions.

Are you tired of writing the same old Cl and MS/DC programs?

Do you want to use artificial intelligence, in tational technologies, integrated CAS tools, graphical user interfaces, cooper tive processing, and object-oriented tech increas?

Do you want to work in e PC developmen environment where your creetive ideas an

Do you want the challe, us of develop strategic, mission-critical applications as partner with clients, to develop a comp

tive business advantage?
Would you like to join an established com

If you are ready for the challenge of working on a leading-edge development team please send your resume to: Date Militial Date Services, Inc., Dept. CWICEGO 5655, W. 110th Rt. Chesten



A United Telecom Compan

An According Screening Employer

An Atomol/Dring Screening Employer Equal Opportunity Employer

ATTENTION: CICS ASSEMBLER PROGRAMMERS

Are you an excellent 370 ASSEMBLER programmer looking for a challenge:

Are you a data processing professional who understands bow CICS works?

Do you know CICS internals like the back of your hand?

Do you know CICS internals like the back of your hand?

Are you truly excited at the opportunity to develop software that will help others solve tomorrow's problems?

Would you like more recognition for your CICS expertise and talent?

If your answers to these questions are all YES, then you owe it to yourself to investigate a career with COMPUWARE CORPORATION.

In 1973, Compuware was a great idea, a dozen employees and \$300,000 in revenues. Now we

In 1973, Compusare was a great idea, a dozen employees and \$300,000 in revenues. Now we are a team of more than 1,000 people with eaching mainframe products and revenues in excess of \$105 Million! A team dedicated to researching, developing, marketing and supporting innovative data processing products and professional services in use at over 4500 leading edge MS stees.

A Composure career can defe you a unique opportunity to DEVELOR, MAINTAIN and SUPPORT to most the best yetteres defered to fill wester. and survey operating system. Plus as opportunity to work such yould write the best developer in the best one-opportunity system. Plus as opportunity to work such you do not provide with the best developer in the fill was . . . popily with the feeds the ordered to enterwise uperating person and environment reach. Composure Technical Development suff has some for a few of the best CLS ASSEMBLES date. Composure Technical Development suff has some for a few of the best CLS ASSEMBLES date.

If you answered yes to the questions allow and are interested in an exciting career, don't wair. Please send your resume, references and salany expectations its: Marx Kay Andries, Compuware Corporation, 31440 Northwestern Highway, Farmington Hills, MI 48018.



Because experience is everything

WORLDWIDE CHAIN
STORE SYSTEM
PROGRAMMER ANALYSTS

WE'VE GOT MO

MORE.... Finer foods, a name so common with quality is sucking self distributing grocery retail chain MORE... Opportunities for reford, with stress Worldow

Chair Store Systems in chair Store Systems in rence at an ISM (303X or 4300) environm having OSAMYS, COBOL and DB/2 Personal satisfact

through excellent star salarms and compent size benefits , opportunity to achieve NORE, send y with salary thousements to Hun rest - CWC, DOMMOCA'S FRIER FOOD

ominick's

AMALYEFS, PROGRAMMERS, DESIGNED

If You Have The Right Stuff,
2 years minimum professional asperse
place and have you be following

in all lead one of the following

special and the f

Perlamo B. - Tourism - Am - Am - Am - Date - Side - Date -

... We Have the Right Service
Thousands of pacoments of companies and stock over 1000 clear companies and stock of the companies and stock over 1000 clear companies and stock

RSVP SERVICES

Let C Sale 114 be Court Will Sel Court Set Lotte

100-222 4"53 = 142 tib-617 200 year a day. Q

Auditors

Middle East, Tax-Free Salaries

EDP AUDIT MANAGER REF LAND

FDP ALDITOR (BET TANK)

INFINITE CAREER POSSIBILITIES

ARE A REALITY AT THE Computing Engineering

or Services, P.O. See 140, Manages, Salvain. Ernet & Young



Computer consulting Group historium Service

1-800-222-1273 (803)738-1994 AX (803)738-9123

ANALYSTS Teco Technologie

AMALYSTS
a Managarrent Information Systems
consuling/services
fem, has minusiaservices
fem, ha

should have 3-6 years experience. COBOL, MVS. CICS and DB2

We offer a highly competitive salery, excellent benefits, advancement opportunity and much more. Forward your

R M CORPORATE SPONSO TUESDAY, SEPTEMBER 26TH CHICAGO HILTON & TOWERS MONTHWEST HALL 720 S MICHIGAN AVE., CHICAGO, IL

11AM-SPM - FREE ADMISSION
""WIN AN EXCITING
RIBBEAN HOLIDAY FOR TWO!" CARIBBEAN HOLIDAY FOR TWO!**

OH! If if November I have precise compared so the beginning to the processing of the proce Produced and managed by Terra Start Co-Op Sa fine. Supported by T L.A.C. and the Testinical Raci llaments. Oract appropriates only All participants of these are produced opportunity of the same action.

Terra-Startine



We service a committee group. Debrat Sales Offices, customer stee, and

r competitive microst, an existending bandles package, an al-forms Carbor an accelerations with constrained, and the op-

253 PROGRAM ANALYST

ITT Bell & Gosserr, a leading menulacturer of livin heading products, has an escellent apportunity for a seasoned professioner to play an integral role at the installation of Custoer Application Software 1.3 Financial Modules.

Qualified candidate will possess 2-3 years expensions with DOS/VSE. COBOL. DL/I or IDMS database, sing with heracist systems including A/P, G/L and A/R, Background with CICS, ADS/Q A/R, CULPRIT or Cultimat Application Software CULPRIT or Cultimat Application Software systems a plus At a valued in the of PT you'll en

At a valued - on liter of 777, you'll misoy a challenging fechnical environment an attractive statery, impressive benefits and strong potential for professional growth. For confidential consideration, please and your resume to Cynthia Kislame, Dept. PA, 177 Beil & Gossett, 800 K. Austlie Arenne, Morton Grone, K. 600SS.

Bell & Gassett

What have entered to be up-toned to particle to a sup-serior reporting the pro-portion of the pro-portion of the pro-lem ASACO & FEE PAGE

PC'S

National Financial Compa-ny seeks Company on-tes C and/or BASIC & MEDICAL Regional Service &LAPL see a plan Emission comme path & resource pag Seeky to Set 2000.

SR. CONSULTANT

OF HOUSTON
DAYA PROCESSING
1306 Peri Day Bre.
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-070
21-07

CITY OF

The Land Control of the Control of t

ARCH TRIANGLE

OPPORTUNITIES

DATA PROCESSING PROFESSIONALS Experienced DP profes some needed for visious long term assignments of the following severances reported by our NAG-VLLE TN, COLLABA 52 ATJANNA, GA and CHAP LOTTE, NC Offices

The Property of States of the States of the

Arreado Chartey pillers to manuface broadles makings labory for the produce to communication with on-pertures, interested and qualified particular are credited to subset to-

TOOL STORY

Compare Schwer Grown and Compare Schwer Grown

COMPUTED CADEEDS NETWORK

Now you can reach the qualified com-puter professionals you're looking for with Computer Co-react Nationals The state and the state of the

ison Computer Com-seen Nativation of the seen Nativation of the seen Nativation of the and communication of the communication of the communication of the property of the province of the province weekly out that province weekly out that province weekly out province weekly out that province weekly out that province weekly out that province weekly out the post province weekly out province were province were province were province were province were province were province province

PROGRAMMED ANALYSTS A SYSTEMS PROGRAMMENS

Sales Offices: John Corrigon, Classified Advertising Director, 508-879-0700: BOSTON: Nancy Per-cival: Andrew Rowe, 500-343-6474. (in Moss. 508-879-0709). Kelth Reighle, CPC

Systems Search, Inc. 203 Heritage Park Lake Wylis, S.C. 29710 NEW YORK: Warren Kolber. 201-967-1350: Jay Novack, 800-343-6474 (Lecal to Charlotte, NC)

803/831-2129

WASHINGTON, B.C.: Katle Kress, 703-573-4115, Pauline Smith, 800-343-6474. Computer Systems Analysis man-ticle in proper companies releases and the language companies releases and the companies of the companies and the 2019 LEASES. 2019. CHICAGO: Patricio Powers, 312-827-4433: Elen Casey, 800-343-6474 LOS ANDELES: Bar-baro Murphy, 714-250-0164: Chris Glenn, 800-343-6474

SAN FRANCISCO: Murphy, roll, Crist 800-343-

Service Collegator Software Stripture careful to analysis confines systems recognitions to the service of the stripture and service of the se

COMPLITERWORLD

IBM AS400; COBOL RPG III. SYNON HP3000: COBOL, IMAGE, VIEW

tetion You Can Be Proud Of.

PROGRAMMERS

WORLDWIDE CHAIN STORE SYSTEMS IS

CONSULTANTS

Assist in installation of our software of cus-tamer sites workwide. This job involves both technical and non-technical duties and requires a willingness to travel. Paid PROGRAMMER/

ANALYSTS

STATISTICAL ANALYST Need one COSOI/CICS programmers a background in statistics to take resis ability for sales forecasting subsystem

Send resume and salary history to WORLDWIDE CHAIN STORE SYSTEMS One East Wacker, 26th Chicago, 8, 40401

Equal Opportunity Employer M/F



AAA MICHIGAN

STRATEGIES ARE THE

DYNAMICS OF SUCCESS.

tax accounting and auditing firms, but we are a lot lust ask the information technology professionals-ing in our Central Repton Management Committee

INFORMATION TECHNOLOGY CONSULTING

DYNAMICS OF SUCCESS

CREATIVE MINDS

PROGRESSIVE MANAGEMENT MEDRINATION TECHNOLOGY CONSULTING AND BOLD BUSINESS



Price Waterhouse

IMS SYSTEMS

PROGRAMMER

CIM PRODUCT MANAGERS

MRP, FINANCIAL MANAGEMENT, SALES AND PURCHASING SYSTEMS

LOCATION: PARIS, FRANCE computer manufacturer (sales \$58) pri id-ends commercial markets. The firm is see ed its expansion of MRP, Financial Mana

ALLAN KARSON

COMPUTER CAREERS MID-WEST



ECTOR DISTRIBUTED VETEMS SERVICES

EXCEPTIONAL OPPORTUNITIES







AS 400 TECH SUPPORT

SYSTEMS

· Ohio State Unive University of Penns University of Texas at Milwaukee School of En Berkeley • Cornell Unive University of Washington at College Park . University Brook - Brown Univer Amherst • University University - Duke Uni California at Irvine • I University at Bloo State University • I Storrs . Southern University Park York . Stevens

Heise Tulane

State Univers · Stanford Un Los Angele Northwest University

COMPLITERWORLD of Technology of California at San Diego • Columbia University emnsylvania State University . University of of Kansas . University of Virginia . Vanderbilt University . United States Naval Academy . U Polytechnic Institute • Washington University Technology . Case Western Reserve University y of Michigan at Ann Arbor . Washington State sachusetts Institute of Technology . University iversity at Bloomington • University of California • Carnegie-Mellon University • University of Illine ersity . University of Pittsburgh . University of To Madison . University of Virginia . Purdue University at West Lafayette . U Washington . Michigan State University . Ohio State University . Texas A& Western Reserve University • University of Southern California • Universit Lehigh University • University of Oregon • Emory University • George Wa: University of Utah • Georgia Institute of Technology • University of Florid Rochester • Pennsylvania State University • Washington University • Univ

Massachusetts at Amherst • Michigan State University • Oakland Universit University • University of Missouri at Columbia • Mississippi State Univer

Massachusetts Institute of Technology • Carnegie Mellon University • Univ University of Illinois at Champaign-Urbana • University of California at Lo Seattle + University of Texas at Austin + University of Wisconsin at Madiso outhern California • Princeton University • University of Litah • State Univ York University . University of Pennsylvania . University of Rochester . Ur Minnesota · Georgia Institute of Technology · California Institute of Techn University . Northwestern University . State University of New York at Bufi University of California at San Diego • Columbia University • Rutgers - Th Bloomington • Pennsylvania State University • University of California at S University - University of Kansas - University of Virginia - Vanderbilt Univ Storrs • Southern Methodist University • United States Naval Academy • U University Park • Rensselaer Polytechnic Institute • Washington University e . Washington University York • Stevens Institute of Technology • Cas State University • University of Michigan rn Reserve University e • Washington State · Stanford University · Massachuset lagy . University sity of California Los Angeles - Indiana University Northwestern University • Car versity of Illine University - Cornell University iversity of Te Madison • University of fayette • LI Texas A&

Washington • Michi Western Reserve tiversit Recruit ton Lehigh Univ University computer career students at Rochest America's universities and colleges

without leaving your office!

Massachu University e University of Rochester Instil

> paign-Urbana xas at Austin . Unive rinceton University • U · University of Pennsylvan Institute of Technology • Cali ern University • State University

University of New York at Buffalo - Syracuse University - University of Ar Boston University . Arizona State University . University of Georgia . Lou College/Crummer • Vanderbilt University • Auburn University • University University • University of Arizona • University of Arkansas • California Poly University at Long Beach • California State University at Northridge • Cali University . University of California at Davis . University of California at Lo of Southern California - University of the Pacific - University of Colorado a Connecticut - University of District of Columbia - Florida Institute of Techr University of South Florida • University of Illinois at Champaign-Urbana • Tulane University • Boston University • Massachusetts Institute of Techno

Expand your career with the world's leader in the design acture of advanced technology rotor and tiltrotor aircraft, Bell Helicopter Textron Inc.

PROGRAMMER ANALYSTS/ SENIOR PROGRAMMER ANALYSTS

base systems is preferred.

Responsible for the design, development and maintenance of systems that support a manufacturing organization. The position requires interaction with the user departments in defining avstem testing/implementation. We require two years minimum experience programming COBOL in a large IBM main-frame environment. Working knowledge of atructured coding techniques and JCL are also necessary. A knowledge of IMS and DB2 data

> Employment Manager Bell Helicopter Textron Inc. Dept. 19-AR P.O. Box 901015

Fort Worth, TX 76101 THE FUTURE IS OURS BY DESIGN." **Bell Heliconter IDAIRON**

CICS SYSTEMS PROGRAMMER



DATACARE * IE HEALTHCARE INFORMATION COMPANY



SEPTEMBER 18, 1989

SYSTEMS DEVELOPMEN MANAGER

The daid pointable oil have a norman of 12 years and wapen orce, a cobine distance, and some point point and point power (5-3). Soil, All Villag lab power (5-4). Soil, All Villag lab (6-4), and the point point point (6-4), and the point point point point (6-4), and point point (6-4), and p

Equal Opportunity Employer MAT 145

Contract Programmer familiar with PRIME Information and the AS - 400 needed to write devisionment, historitary data communication or indepression-ing, Assembler language and data-bolish devisions or communication. Tra-scripts and Passers are required. 40 Provide Man to Pri 5 act to 5 p. 1936-77 per annual voids no constitute, Again at the Tasses Do-ries and Communication. Traff Bullet-physioners continues, TSC Bullet-

NEW POSSIBILITIES IN SOFTWARE ENGINEERING.

Explore them at Space Transportation Systems Division in Southern California

To seek out new possibilities of involvement in tomorrow a space programs, you have to be willing to give a little extra. and reach a little higher At Rockwell International Corpora-tions Space Transportation Systems Divi-sion, we re doing just that.

From Apollo to Space Shuttle to today's SABIR/SDI program our professionals carry on a tradition of innovation that knows no exhall il you share our spirit of exploration we'd like you to join us. Together we can explore the in-finite possibilities of space technology.

We invite you to explore your possibilities in the following Software Engineering positions

VAX/VMS Management

& Operations You will be responsible for system administra-tion of a large VAXCuster-based software development enforment. Requires 3 + years conference for the system of the system Lenkarry with the Ad programming language and knowledge of heterogenous Ehrment net-works. Experience with offware development projects. DECnet SNA. TEPIP stational de-velopment, environment and Unit/ULTRIX operating systems is a plus.

Unix/ULTRIX

You will be responsible for system administra-tion of workstation components of a software development environment Requires 3 s years programming experience on Unix and Jamiliari ty with the NFS. C. Ada and Ethernet networks. Experience with software development pro-iects. DECnet. SNA TCPIP Rational develop-ment. MINIX. ment environment WAXIVMS operating system and Apollo. Sun and Digital hardware is a plus

Project Analyst

You will be responsible for analysis of software development projects and environments. You will participate in project reviews and apply hands on experience to project development, issues: provide technical assistance at critical phases during the project filestyle and prepare software development plans and select tools and

emetion Systems Analyst

You will need at least 2 years experience with Oracle or Rido disabase development projects encompassing all file-cycle phases flequires strong communication, team building and leadership skills Experience with MIL-STD-7935S VAX/VMS or Unix development environments SOL and object-oriented

TO A5 - 400

You will need at least 2 years expen You will need at test 2 years experence w Ada development projects encompassing ille-cycle phases. Requires strong communi-tion, team building and leadership skill, perience with MILSTD-2167A WXZVXIS U-or Rational development emirorments a embedded systems is a plus.

We have opportunities in a variety of areas. All positions require a B5 or equivalent in Computer Science or Business idministration, with information Systems emphasis.

Perform requirements analysis, prototyp and database design and development, v experience must include D&J/SQL (or or DBMS). C and COBOL or PUT languag IBM Mainframe in technical informat

Perform requirements analysis detabase design and development. You will need ex-perience in IMS for other DBMSs on IBM Mainframe and skills in \$50. CLIST and ICL.

Develop system requirements for configura-tion management of database systems. You must be lamillar with IMS for other DBMSI on IBM Mainframe.

on to the headers and pass prototyping and database design and development. You experience must include DB 25QL or other DBMS: C language integration of text and graphics 18M 18b pleaform. Unit on Sun or Apollo workstation and text-includ documentation systems. Ade experience is a plus

ution systems. Ade experience is a plus. Perform reculements Janulys, ponotoyping data modeling, and detabase design and development. You will need experience in DB2/SQL for other DBMS. PL/I language IBM Mainframe TSO, KL. CLIST, prototyp-ing for technical information systems. Database Administrator experience is essen-tial. Ade experience is a posi-

Perform software engineering tasks related to database systems development. Your experience should include DBMS respecially relationable for technical information systems. Platforms include VAX/VMS MAcilland PC's.



... where science gets down to business

UNRELT & ATLAN

COMPUTER CAREERS



Join a Proud Member of the NASA Team

Computer Scientists/ Systems Analysts ADABAS/Natural As a SEMOR LEVEL professional you will be actively avoided in the design, development and implementa-tion of Suuriess and Engineering Applications in a

cations richide Financial Systems, Inventory Cor Management Information Systems and Resource into and Trackers

norum of 4 years business programming on IBM MVS systems and sur MVS analysis and lighters design requirement in country Euperson o salery history, in strict confidence course will be 128, An Co.

BOEING

sistant Director for User Services

ting Services Office of the Uniquely of Street of UniqueOran-Landing or redestant to recognite their Services specifiers. The services of Services Services of Services, Services, and off services of Services of Services, Services, services, Transition of Services, Office services for Services,

COS as now as country ofter Orders 2, 1985

on his construction by this position, phase called your concessor 2, 1760 to Aspen McCalle, Comparing Services Office, Law of Silvan, 1994 of Services Aspend, St. 568, Lineau, Street Silvan (177) 265-1274. Parameter of Street or Advantage Adv

CASE

SPECIMENTON ENGINEERING
ENTERPRISE MODELING

SINCE SPECIMENT SOURCE IN A SECOND SOURCE

SINCE SPECIMENT SOURCE IN A SECOND SOURCE IN A SECON

the to 5-15 years, State Super, early to your and Ann AURT CASE HALBRECHT



89 Salary Survey

makepus againate to the Pro-year.

Regards S.S. in Computer So-ments and 5 paint recovered in an extra gard paint recovered in an in amorping including 400 cm. in amorping to the computer of the computer

\$15.003 year \$ 50 a.m. 5 40 pm, Mar An Equal Opportunity Design of Designs 1

SOFTWARE **OPPORTUNITIES**

CONSULTING OPPORTUNITIES PER DIEM OR FULL TIME!

* STRATUS * VAX/C or COBOL * OS/2 * IMCRO ASSESSE. * BUN WORKSTN * UNIXAC * PL/I or COBOL

PC/DOS EXPERTS Tekmerk Computer Services, Inc.

(212) 600-6000 (201) 806-2021 FAX (212) 603-6047 Notwork Support

or wind the plant

or wind

or

-The Unionity of time is an Equal Copyright Street or Action for POCKLEDE SYSTEMS (Sep-rettly reports Cody and dep-pended Foundary Based Sys-tems of Foundary Based Sys-tems (Artister Irredigness for the arter returns using LEP. C AFT LEP residents for Touches, P.C. STEM and Appell and a return of the Company of the return of the Company of the return of the Company of the extensive artificial insellence statements artifi contracts, whose expellency, and a service of the contract of

of Control of Control

rrich Wastre stract Software Consultant

EXCLUSIVE POSITIONS

PROGRAMMER/ ANALYST

Using DECard offer com-puters. Nativorking, PLCs. Distributed Chroni Splinting and US based positions of the part chie a feasification who specialized. For the communication orders or the communication of the communication o

TANDEM STRATUS PL1. COSOL, C ma/Consuling For

AVOC MEN COVA

STORES SESSE

CIM

Factory Process

PRODUCEMENT AND THE ACT OF THE AC STRATEM COMPUTERS IN Cad brain (212) MET-2010 PAX (212) MET-2010 TOI W. 30th Dr. Salte #301 May York MY 1000 MICROCOMPUTER

COORDENATOR

SSPIN - SMIL are partir than an
CO man Ser Provincia vocale
for contracting the contracting
for constructing production of the
contracting prod PROFESSIONAL

CA & AZ Winning CONTRACTS Resumes • Comment by Brokening CONSULTANTS Omment for Impact WANTED Computer Laborati Printing Complete Confedentiality

405 INVIDUOS DINNE, SUTE 100 BURBANK, CA 91505 (FIT) 941-2002 (714) 562-0501 (500: FIT) 941-2122 LOW 40%

Roberton a Septemberloope
self integer sergeogen in
Oward. Siles of the an
solid fine resets for gasdisease self in seminar of
2 years COOOL in an liber
with FIRMS 140° 100° 100°
years COOOL in an liber
with FIRMS 140° 100°
years COOOL in an liber
with FIRMS 140° 100°
years COOOL in an liber
with FIRMS 140°
years 140° 100°
years 140°
years

MIS DIRECTORS

DIRECTORS

if you need good people, we've got them. Compowe've got them. Compothem 612,000 computer
poor every week. That's
noor qualified computer
proor that any newspaper
can deliver. And you can
select either a negional
edition or rasional edition of Computer Computer
computer Computer
Computer Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Computer
Comp For more information; or to place your ad ergional-ly or nationally, call Lisa McGrath at 800-343-6474 (in MA, 508-879-0700).

Loady to Contact Prop with \$7 LEAST 2 years may up in \$50.00

DET WICE, TILDA PACENCE.
DET WICE, TILDA PACENCE.
AND DITACONAPCICO'C CCC.
AND DITACONAPCICO'C CCC.
AND DATACONAPCICO'C CCC.
AND DATACONAPCICO CCC.
AND DATAC

C.R.T.

Weekly, And It-

COMPUTERWORLD

SEPTEMBER 18, 1989

SAUDI IRON & STEEL CO. (HADEED)

Saudi Iron & Steel Co. (HADEED) is a modern igrated steel producer located in the new justical city of Al-Jubail. Production facilities include direct reduction ironmaking, electric arc steelmaking, continuous casting and baritod milis Experienced and technically qualified sicants are invited for the following vacancy.



STEEL PLANT SOFTWARE SUPERVISOR

Responsible for the software support and services in terms of system, application and information reporting in a real time distri-buted process control computer, comprising of 3 electric air hursices (1907 each), 3 × 6 strand continuous casting. agedine are furnaces (1801 each), 3 × 6 strand commutus casing machines and the subsystems, central control room and other production monitoring and data entry stations. Also co-ordinates with hardware group responsible for high system uptime.

- Applicants should have an appropriate technical qualification and:
- * knowledge of data structures, life systems and DBMS. * software in F77 Pascal or C Language
- * five years' experience in real time process control software
- . ideally some steel plant exposure

The company is part of the prestigious SABIC group of companies and offers excellent 2 year renewable family status contracts, tax-free satients, the furnished accommosation and unities, free health care (including BUPA), personal insurance, education ellowance, car purchase scheme, 6 weeks annual vacation with air lickets and contract completion bornetit.

Applicants should write in English enclosing their CV and contact elephone number or atternatively toletax to

Programmers & Programmer

Major Expansion

Specializing in SP to one 16 years have exact in cost Please and recent in Self-Recigionary or cut 015-075-0162 The Deta Group P.O. Box 17968 Raleigh, NC 27619

Morgan Day Ltd.,
Recrutment Selection Consultants,
85 Carshation Road, Sutton, Surrey, England.
Tet 01-642 4437 Fax: 01-642 0454



or thing or their conditions will have at at one year secondly larguage at at their secondly larguage at their secondly larguage at their secondly larguage at their secondly larguage at their larguage at their

MAINE - NH He have specialized in fats processing protec-alonal piscement in Idaino & HH for a quarter of a century. If you qualify for positions in the \$25,000-\$50,000 range, please contact us in total

BLROMAC.

Ferture 500 company solid a solicer develop-ner professional with a-ther application support and of graphic develop-ment. Experience on CRC WK contents in manual. EDE

on MS is template accordingly beginnering with a strong besignment in study and according to the control of the action position, also the control of the action position of the action position of the control of the control of the action position of the control of the

WANG VS AS400 DB2

Both full-time and sub-contract arranga-ments will be consid-ared. Salarias ara based upon level of meriance. Sand re-middence

SOFTWARE DEVELOPMENT **PROFESSIONALS** Healthcare

SOFTWARE DEVELOPMENT ENGINEERS

Experience with fault tolerant platforms, UNIX operating systems, high-languages such as Fortran, C. PU.1, and Pascal is an advantage. Exposu workstation technology, graphical user infantaces network protocols, micro platforms or conventional healthcare applications will butter qualif

DATA BASE ARCHITECT

A serior poetion is available for a data base architect/administrator with a Computer Science degree and 5-10 years experience in database develop-ment. Responsibilities include identification of IDMS southors for CMC is products and design of distributed data base applications. Expelium to Cardio, larges. Sybase or related products and experience with use of this technical for the computer of the computer

SOFTWARE VERIFICATION/ VALIDATION ENGINEERS

Entry level and experienced personnel are needed to perform software tes and verification. You will create detailed test plans/procedures, conduct int gration and system test operations, periodopte in product and configurate management reviews and provide guidance in all development phases to sure quality products.

sare quarry products.
A degree is Computer Science or Engineering with experience in Fortran, and earlier to manufacture patients, and extraording is a requirement. In the manufacture patients, and expensions, and expensio

ed, send resumes and salary history in confidence to

Director of Human Resources 5 Greenway Plaza, Suite 1900 Houston, Texas 77046





CONTRACT PROGRAMMERS

Lestine and liver beloase - basic by To 2555/host

- MES BN/NC - +PCSS - 498,785

- 485 BN/NC - 492 - 498,785

- 485 BN/NC - 492 - 498,785

se in one of the above. Call If you have it or more years experience in one of the above. Or Uh. Toll free or 1-800-347-1670 or send your resums to 2900 Energy Cente 1100 Replace SI New Orleans, IA 70163-2900 III (504) 565-7219 FAX (504) 565-7201

VAX/VMS OPPORTUNITIES

Growing Fortune 500 company, located in the Southwest, is moving towards a distributed VAX environment. The following, positions are available for experienced DP Professionals:

- APPLICATIONS DEVELOPMENT using CASE tools or 4GL RDB DATABASE design, implemental
- VAX/VMS SYSTEMS relection, installation, and s DECNET COMMUNICATIONS distributed network design and sup

Computerworld
F.O. Bon 9171
Framingham, MA 01701-9171
Framingham, MA 01701-9171
Grant Organization of employments
Drug comming is a present of employment











Now you have a new way to recruit university and college students planning computer careers:

Computerworld's second annual **Campus Recruitment Edition**



Issue Date: October 31, 1989 Close: September 29, 1989



If you recruit top computer career students on America's campuses, your message in this special issue will target more of them than any other newspaper or magazine!

Now you can recruit computer talent on campus without leaving your office! That's because 115,000 copies of this special issue will be distributed to America's best and brightest students enrolled in Management Information Systems (MIS), Computer Science, Computer Engineering, Electrical Engineering, and just about any other computer-involved curricula.

Finally you can cost-effectively reach the quality and quantity of students you need!

And you can do it with just one ad in Computerworld's Cambus Recruitment Edition! For a rate card reflecting complete campus distribution, call John Corrigan, Classified Advertising Director, at 800/343-6474 (in MA, 508/879-0700). But hurry . . . this issue closes September 29!

Planned Editorial Features: (subject to revision)



- Where are the best jobs?/What positions are hot? Experiences of recent MIS graduates in their first jobs and what helped them in school
- . The MIS career ladder
- · Profiles of acclaimed too level MIS executives
- The strategic advantage of computers and how they play a key role in running a company

CASE SOFTWARE PROFESSIONALS

TRAKSFORM LOGIC CORPORATION

citi. & Bryant, Inc., a management consulting company p are development services to utilize, government and privi openings by CP professionals with the billowing opening

DIRECTOR

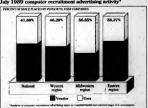
To apply, submit letter of application and resume to Human Resources Department ACT National Office, 22th North Dodge Street, P.O. Box 168, Iona City, Iona 522 Application deadlest October 2, 7999.

CONSULTANTS AND
PROGRAMMERS
SuffWer. NOUSTON'S persue data processing or siling firm. has a solid cleanals of Former 500 comp-ries. POUSTON'S storage connecer recovery has one and immediate, top-paying contexts for professionals will too or more years experience in the following sense.

Other Officed It: Mangels, TN Records, TN, Atlante, GA. Jackson-No, FL, Tampa, FL, LATA Rock, AT, Jackson, AS.

CAREER INDEX

July 1989 computer recruitment advertising activity*



World Class Opportunities in New Jersey, New York, Connecticut, Ohio, Michigan, and throughout the US

For over 22 years AOS, a NYNEX Company has played a major role in designing and building computer systems for



We currently have opportunities in our 36 branch offices nationwide for Data Processing Professionals who are eager to begin a world class career by joining a group of AGS top performen.

Immediate openings exist for those with experience in: ADABAS • NATURAL

AGS offers outstanding career advancement, competitive salaries at an excellent benefits program including medical and dental coverage relacation assistance, training, tustion reimbunement, a 401K saving plan and more.

To find our why over 2,000 computer professionals consider AGS a 'world class' employer, call or send your resume to

Lone Tisdale, National Recruins AGS Information Services, Inc. 1139 Spruce Drive Management. NI 07092 1-800 HIRE AGS Fax: (201) 654-9794

A NYMEDIC Company

An Equal Opportunes Employee MRRSSV

PROGRAMMING CAREER OPPORTUNITIES IN "MARDI GRAS" CITY

STRONG, GROWING BANK
 EXCELLENT COMPENSATION

A working knowledge of ROSCOE, LIBRARIAN, CICS or BAS DB:/DC. OUICKIOB, and BTS is also designable for all the

COME JOIN ONE OF THE FINEST DATA PROCESSING



MARKETPLACE

The fight for software rights

loint development of customized software leads to copyright confusion

BY RAYMOND T. NUMBER

"Understand what you are buy-ing or adling and get what you pay for."

These rules govern all con-tracts for notiveare, but they are hard to apply to many agree-ments for castomized devolu-ments for castomized devolu-ments for castomized devolu-ments for castomized devo-ments for castomized devolu-ments for castomized devolu-ments for castomized devolu-ments for castomized devolu-ments for castomized or most disputes over software

If you intelly bey packaged notware, with all its indexent writerings and blemishes, deciding who controls its use should be a traightforware. Under to-day's law, the endiware provider proportion of the proport

nt.
Deciding who controls the
twore and what rights the
ties hold is much more diffi-tiors software developed or
tomised for a particular purse. Here, both the developer
the acquirer contribute to

rormsnoe reatures by causing to and interacting with the users. For buyers with technological expertise, the interplay between designer and client can be exten-sive, with frequent consultation

Key questions. Who 'owns' the software' Who has the right to modify it' Can the designer sell the completed activate, or parts of it, to other activates, or parts of it, to other activates or parts of it, to other hanging on which the bayer hanging true. Very often, the bayer has far, far fever rights regarding the software than expected.

than expected.

At one extreme, the transaction may be the same as that of a purchase of packaged software.

The software designer provides the creative authorship — designing the structure, laying out the user interface and writing code. The designer is the sole au-thor. The buyer holds the end product as a mere licensee.
At the other, less corr
extreme, the buyer is exter

the software's final form. The byper provides information — ture and interfaces, perhaps often quite specific—about even in some config. The soft-functions to be performed or ware supplier serves more as a other needs. The software designer makes choices about performance features by talking to extra the designer about his choice as the software designer makes choices about performance features by talking to license to use elements of the software in the future. The copyright is owned by the buyer.

Usually, transactions fall somewhere between these ex-

ERY OFTEN.

the buyer has far. far fewer rights regarding the software than expected.

and contributes to the design of the user interface but does not code. The software designer creates the program's structure, consulting with the prospective end users in doing so.

It is important to remembe

that many of the rules of software copyright come from a field of law intended to address authorship of articles, novels and poetry. You can begin to see the problems in deciphering author-ship and control of software. Are

the parties co-authors or separate authors of distinguishable parts of the package, or is one or the other the sole author?

Addressing such questions in software contracts calls for several of the following consideration

e Decide who has the right to make copies. Very often, the best answer will be that both

rties have some rights. Of wants to make backups or use more than one copy. The issue of more than one copy. I he issue of the right to copy can be equally important for the software de-Decide who has what rights to

modify the software. Copyright law gives the "author" the sole law gives the "author" the sole or exclasive right to make deriv-stive works. Some copyright cases suggest that this covers the right to modify existing copies. If it is difficult to decide copies. If it is directed to decide who is the author, it is important to expressly agree about the right to modify the copy delivered to the buyer.

Decide who has the right to distribute copies to other the copies.

distribute copies to other par-ties. Users usually intend to use the software in their own operathe software in their own opera-tions. Even then, however, some buyers plan to resell it. The soft-ware designer, on the other hand, may want to use all or part of the software in future work. Unless he is the sole author or the co-author, he has no right to do this without an express agree-

Decide who holds the responsibility for failures in specific aspects of the program. When the parties work together to make a product, they must understand the shared responsibility they are undertaking. If the user interface is awkward and unman-

terface is swivered and unman-ageable, for example, is this the responsibility of the program-ment of the program-lufortunately, many soft-ware projects proceed on the as-numption that problems never cours. Experience shows that they can, however, especially when planning is instequate. Paying attention to what you are buying and agetting what vou

uying and getting what you are paid for is critical to effecsoftware development Neumer is counsel to the low firm of Sneinfeld, Maley & Kay in Heuston and author of The Law of Computer Techiors, published by Warren, Gorbarn A

Index Marketplace 113 Bro/Self/Lone 112 Software 114 Graphics/DeskTop Pub 116 Bid Proposity Real Exper 116 Russess Oppositions Dec/Senten 1115 LH

Buy/Sell/Lease

All Models New & Used 60 to 90 Upgrade Special

PH: 1-800-553-0592 n MN: 612-931-9000 WORLD DATA PRODUCTS

Whitewater Drive, Suite 130 eles, Minnesote 55343 U.S.A. FAX 612/931-0930

Bull DPS 7000

FOR SALE Ą

G

NEC Multispe

(314) 361-3600 Ask for C. Begley

The BoCoEx index on used computers

-	Closing	Recent	Recent
M PC Model 176	\$525	\$625	\$400
XT Model 086	\$750	\$1,150	\$700
XT Model 089	\$1,025	\$1,400	\$950
AT Model 099	\$1,625	\$1,850	\$1,400
AT Model 239	\$1,500	\$2,100	\$1,700
AT Model 339	\$1,850	\$2,000	\$1,700
PS/2 Model 50	\$1,675	\$2,000	\$1,600
PS/2 Model 60	\$2,625	\$3,300	\$2,500
ompaq Portable I	\$450	\$750	\$325
Portable II	\$1,700	\$2,000	\$1,650
Portable III	\$2,500	\$2,800	\$2,200
Pertable 286	\$1,600	\$2,000	\$1,600
Plus	\$800	\$1,200	\$675
Deskpro 286	\$2,025	\$2,350	\$1,700
Deskpre 386	\$2,750	\$2,900	\$2,500
pple Macintosh 512	\$475	\$650	\$300
512E	\$550	\$925	\$475
Plus	\$1,000	\$1,150.	\$750
B	\$3,050	\$4,175	\$2,500
ohlba T-3200	\$2,650	\$3,000	\$2 475

\$725

AJC: (017) 871-4456

TO BOX 71 + 610 BRYAN STREET + OLD HICKORY, TENNESSEE 37138



HONEYWELL

IF YOU'RE BUYING, WE'RE SELLING

IF YOU'RE SELLING, WE'RE DUTING Day & Bed & Lease PERSON (800) 331-8283

(213) 394-1561

Ocean Computers, Inc. 111 Saves Money Blog. Str. 200 Computers, CA 20001

DEC VAX & AT&T

BUY-SELL-NEW-USED

(X)

LDIA



\$\$\$ WE PAY CASH \$\$\$



And we still do Computer Marketpiace has bought thousends of IRM AS/400, Sense 1, 5 3X, 43/0X, 30/0X, tapes, doves, printers and other peopherals and we are very interested in offering you top dollar for yours.

We also deal to data communication assument such as seek Or if you have a need to buy, call us first and BUY DIRECT from the

COMPUTER" 800-858-1144 HARKETPLACE in California, dail (714) 235-2102

PRIME

EXPERIENCED SYSTEMS AND

PERIPHERALS SUY-SELL-LEASE-BROKERA NEW PLUG-COMPATIBLE PLUS THE FASTEST I/O /AILABLE ANYWHERE

1ST SOLUTIONS, INC 11400 N CAVE CREEK ROAD

godal IBM

VAX RENTALS

MV 3600 MV 3800/3900 VAX 1-300 SERIES VAX 8000 SERIES Systems & Peripherals

BROOKVALE ASSOCIATES CHIA ---OKDS €

516) 273-7777 (206) 392-9878

MEMOREX - TELEX

LEASING ASSOC. CORP. (203) 978-1400

> It's the CLASSIFIED MARKETPLACE

00-343-6474

Over 612.0

Systems, Perspherate, Options Looking to purchase WAX and AT&T Systems, Hardwo AKEWOOD COMPUTER CORP. COLUMN LAND 000

IBM BUY · SELL · LEASE

SYSTEM 36138 SERIES

30XX AS |400

> 11 111 514 T 1551 313115

Pennherals

(800) 888-2000

A3XX

AT&T VOICE

SYSTEMS

We buy, sell, lease & rent quality new and used equipment. And we stand behind it for a year.

375A WEST HOLLIS ST. NASHUA, NH 03061 TRA

Phone: 603-886-0383 Fax: 603-886-0914 digital

1-800-ICE BUYS

"YOUR ELECTRONIC TRU FLOOR FOR USED COMPU 212-614-0700

☐ IBM 3101's ☐ MPI 99 Prints ☐ MPI Sprinters

SEPTEMBER 18, 1989

COMPUTERWORLD



MAI SIC

MPx9410 & 9520 many peripherals!!!

617-267-8600 EQUIPMENT REMARKETING



MACINTOSH * APPLE 2 1-800-262-6399



Boston Computer

Exchange Corporation

MA 617-542-4414 FAX 617-542-8849



WANG

IBM

BURROUGHS UNISYS B20 - B7000 A Series - V Series

All Peripherals ow Lease Rates

oot Mainter

COMPUTER PRO CORPORATION (216) 687-0307

TBM

BUY SELL LEASE PS/2 OPERATING 3084 3090 PERIPHERALS

OEM/PCM LEASES

EST.

800-888-7568 COLD

Buy IBM Sell 36 38 4300 LRK RESOURCES

BUY & SELL DATA GENERAL

Desktop to MV's ms - Upgrad

AMES SCIENCES, INC. (301) 476-3200 SAX: (301) 476-3396

CALL US LAST

GET YOUR BEST PRICE Then Call

COMPUTER BROKERS, INC. For The Rest Deal

Buy - Sell - Leese - Rent New and Used IBM Equipment AS400 - System 36, 38, 43XX

28) = CB CB CB CB CB CB CB CB

CB CB CB CB CB

9

Ç.

WANTED

ORSOLETE

AND EXCESS

COMPUTER

Ton Cosh Pold

Call today for a quote on your system.

COMPU-SCRAP, I (617) 341-2695 Call Collecti

Modules/Disk Paci

CBBCBCBCBCBCBCB

СË

HP 3000 ATP's a S/70

7937H • 7933H ralable in Ownershy ors @ Porto

wanted to qualify for BUY . SELL . TRADE

THT & LEASE ConAm Corporation It's Performance That Counts! 800/643-4954 213/829-2277

to Buy Your Su

 ∞

HEWLETT - PACKARD 1000 · 3000 9000 Computers • Peripherals Terminals

Buy e Sell e Rent e Leasa FURODATA INC

613-745-0921

Series/1 AS/400 System 36, 38 4300

612-942-9830 DATATREND.

Time/Services

Software Packaging

800-243-1515

Star Byte.Inc

ICOTECH

(201) 685-3400

IBAY's lettest Detablese & End-User rove DR2, SQL/DS, CSP, QAY, AS, GDDAR Gregolics

A DEC/ANX Timeshaming Services a 24 Hour Metwork Control Control & Woold-wide Communications, Services

Laser Printing Services

A Educational Services 1-800-759-4454

COMPUTER

TIMESHARING

e We find your lowest prices e liggiornide service since

· HEVER a charge to the e Our fees paid by the Sell-

Call Don Solden at

mputer Reserves, Inc. (201) 688-6100

Full-Service Cost-Effective Compute Utility

II Three IBM 3090F CPI is

Operating Environm

*MVS-ESA, XA, SF

*VM-XA, SP, DOS

*PRISM

S*

B DB2 and IMS Date

Fechnical Support Desk •24 hours-7 days/week wide Network FLEXIBLE SOLUTIONS

from epecial project data center replacer

Application and
 Engineering Processing
 Financial, NASTRAN,
 ANSYS, SAS ...

MSA-M&D Support Conversion Services

Client Disaster Recovery

ON-LINE WITH

■ Multiple centers ▲MVS/XA VM, DOS

A RACE CICS, IMS ▲SAS, DB2 ■ Volume and term

discounts ■ Worldwide access

support ▲ Laser printing

▲ Disaster recovery

KOPPUSOURCE

CONVERTING

-Honeywell to IBM Assembler to Cohel CICS Macro to Command DOS to MVS

any Cobol to any Cobol Professional staff sperienced in conversion.

pecific methodologies for:

NEOSYNETICS, INC. 3158 Des Plaines Avenue Des Plaines, Illimois 66018 312/299-0900

312-574-3636

COST-FFFFCTIVE COMPUTING SERVICES for TOOAY and ... TOMORROW

COMDISCO SERVICES CORE

rovides you with

the-art computing services

IDM+ CDI le sort

Systems Software MVS XA TSO E ISPT PDF CICS VM XA VM SP HPO CMS Application Software

Application Serewire Database Management Application Development 4.Ot s ncal Analysis Multiple Communications

SN-s response baseurs of

For more information Call Jeff Davin 201-896-2030

COMDUCO

REMOTE COMPUTING OUTSOURCING

· MVS/XA VM/370 DOS/VSE • CICS • CMS - TOO • DB2 · IMS/DBDC

OVER 150 SOFTWARE PRODUCTS

• DEVELOPMENT

 DEBUGGING
 PRODUCTIVITY PERFORMANCE

. TELENET . TYMNET SEARSNET
 IBM INFORMATION NETWORK

EXTRAORDINARY CUSTOMER SERVICE MIGRATION MANAGEMENT

GIS

INFORMATION SYSTEMS, INC Oak Brook, IL 60521

617-595-8000

MEETING THE MIS CHALLENGE

Litton Computer Services The Outsourcing Experts

ability, availability, security, response time . . . Litto puter Services delivers flexible autourcing solution ours a day instantly and cost-effectively on advance a scale information processing systems.

CALL 1 800 PLAN LCS (1-800-752-6527)

DATA CENTERS

Boston

Computer Services

MULTIPLE IBM 3090 MACHINES DEDICATED OS SERVICE TIMESHARING SERVICE DEDICATED MACHINE SERVICE

Flexible Solutions: Short and Long Term COMPETITIVE PRICES

Call Pat Holland at (212) 750-6100 RECRUIT U.S.A., INC.

REMOTE COMPUTING AND FACILITY MANAGEMENT SERVICES

IBM MVS/XA Environmen
 DB2, IDMS/R, Model 204

Disc, Lowish, Model 204 and 4615.
 Professional Support Staff Experienced Migration Management Team
 Full Supporting Services — Modal Conversion — Laser and Impact Printshop — Application Programming Simplified Pricing and Invariana.

Technical Support —
 24 Hours a Day — 7 Days

lav&Spek.is 1501 Opus Place

Downers Grove, IL 60515-5713 (312) 964-1501 For More Information Contact: Tony Ranieri

et Us Be Your Data Center

Get high-quality computer service that can make a deference to your bottom Prom MCN Computer Se

Full ISM compatabilit MVS-ESA

FILE-AID CICS PLAYBACK

· Letter Shop

or more infor 1-800-521-0444

MCN

Time/Services

SYSTEM ENGINEERING

pplad System lingineering and Development Corpo-tibility a reportation in a blatt-Vendor Integration Sys-tem and Video Systems. List on provide you with ECHNOLIGY TODAY: and lengtane your System to a cost effective "TOTAL SYSTEM" solution. intens to what our customers are saying:

our system requirements.
ASED "Total Solutions" inch For more information call Ran Johnson today: (919) 469-0564, no send your requirements to: ASED Corp., 2000 Resency Plays., Suite 185. Cary NC 27511

EXCLUSIVE OFFERING FREE TRIAL PERIOD—MAJOR COST SAVINGS

FULL SERVICE COMPUTER PROCESSING BM 3090 Processor-MVS/XA & VM/HPO. TSO. CICS

Broad Software Support Product Line
 Domestic & International Network
 PROFS, Decision Support Products

 Data Base Management
 Banking/Financial Services CALL 1-800-443-8797

FINANCIAL TECHNOLOGIES

NEW AND USED RAISED FLOORING

diate Delivery ality installati

CLASSIFIED IARKETPLAC 612,000

COMPUTERWORLD (800) 343-6474

Computerworld's

Classified

Marketplace

this military is own verified by the la-larity of Corollesian in the easy self-dently self-off meading severy of the 8. What's more Comparatives of the 1. What's more Comparatives of Com-tion of September 1. The Verified is all supple industries. This Verified is all supple industries and self-ce the property of comparing products and one whopen of comparing products and one

Business Opportunities

SOFTWARE of Company bellions Company the party of the p

-

0-541-9915

800/343-6474 (In MA. 508/879-0700)

Software

FREE BUYER'S GUIDE

Programmer's Connection
7249 Winagle Are Wit
North Content One 44729
US 800-336-1166
Cause 800-235-1166
International 216-494-3781
FAX 216-494-3783
5102-406879
5102-406879

Aggressive ide Sales Force

A highly experienced six sersor, sales force is ready to merket your product.

ESE Associate (215) 293-0200

HEWLETT GENUINE TONERS *8150

IBM TERMINAL SCREEN to BIG SCREEN

her systems from 1599

CORPORATION

BOXLIGHT

to or Complete II

Graphics/Desktop Publishing

 Reco pseudo-comprier
 Reco pseudo-comprier Carl darker, has a form 100 days front our

(214) 750-8112 Billy Guthrin

PROJECT

LEAD ----\$249.00

******** - MRCICS

Peripherals/Supplies

CLEAR YOUR DESKI

CPU Floor Sta \$95.00 urdy, Attract

CLASSIFIED MARKETPLACE

CALL NOW

800-343-8474

Bids/Proposals

Consider specifications may be obtained from the COM office. The COM reserves the spirit response to the spirit response and t

The Computer and Data Com-marications Services Agency of NY, is soliciting proposes for the purchase and mainte-nance of a Microcomputer-Meintrame Integration product. To obtain a copy of the Request for Proposal please call Jeff Burns at 212-204-4318. Proposals are due by October 6, 1999.

Attn: All XEDIT Users Crass company room bosts and 30 want will your SM PC or compatible from those of com-pour companies makes 4 gard and stay from 1791. Call for from breakers Money Said

ROOMER2

P.O. Box 37505

Hardware

BUY SELL LEASE

DEC/VAX

CALL

LDI/ COMPUTER PROVISIONS Lou Vascek (216) 687-0307

South proposed will be account by the COPY, Still Laner St., 301 Busing, Submit 100, June 101, 2021 by the Stilland Request for Proposed No. 1991, can Tues by, October 3, 1988 at 3:30 pm. for the an publish, of an electron management contract or ATAT companies anappement for the Mil-Scoppin BOX, AND WATER CONSISTENT TOTAL COMMISSION.

Respect for Proposal No. 1863, can recovering, Carbon 18, 1864 of 250 can for the sequence of an invital deviation for the sequence of the second con-page Carbon to the Management State (Second Carbon State)

Computerworld's Classified Marketplace

needs only 6 days notice to run your ad!

The property of the property o

800/343-6474

TRAINING

Trying out techies as teachers

Tapping IS pros as instructors, tutors and mentors can benefit everyone

BY SUE REDKEY

Times have changed. Gone are he days when it was acceptable rmation systems profe ionals to communicate b with machines than with he seings. Today, more tech fessionals are trying to im-we their communication skills heir jobs increasingly rum to do so. From mar applications programs work directly with clien no work directly with clients to stems programmers who pro-de hot-line consulting, IS pro-ssionals are finding effective minunication a key to success.

One benefit of this change is not firms can now tap technical seople in ways that were not stactical 10 or 20 years ago. For instance, it is no longer so uncommon for a senior program-mer to effectively act as a mentor for an entry-level trainee or

for a systems programmer to successfully teach a class. Clearly, the IS training deent benefits from such en-ment of skills. Technical

that people who can "do" cannot necessarily teach are now realiz-ing that with some appropriate training, many technical profes-sionals can make fine teachers.

sionals can make fine teachers.

The training staff can take advantage of this resource of technical professionals who communicate well by encouraging them to volunteer for the following

Volunteer instructors, Volunteers may be your only in-house instructors, in which case they might have to develop and teach full-length courses. In oth-er cases, volunteers may supple-ment a staff of full-time trainers, providing depth, advanced ex-pertise and current knowledge

of your installation.
The use of volunteers —
those for whom teaching is not
part of the regular job description — works best when one or
more of the following are true:
• Your budget prohibits hiring a

vendor.
• The subject matter requires in-struction tailored to the specifics

as when the class is one day or less in duration or is already de-

rienced technical professionals can make excellent mentors or coaches for entry-level person-nel. In addition to providing be

ECHNICAL EDUCATORS who have been aware that people who can "do" cannot necessarily teach are now realizing

technical assistance, they can also help the new person adjust to the culture of the company or work group. A typical mentor may appeal only two or there hours a week assisting a trainer, but the difference that that time cervisie come: ervisie come: ervisie come: ervisie come: ervisie come: ervisie come:

but the difference that that time makes can be significant. Tutors. Using subject-mat-ter experts as tutors is one way or making self-paced learning more effective. A tutor may ar-range specific times to meet or just be on call for questions. new skills, a broader outlook and often increased self-confidence. Recognize that teaching, coaching and tutoring skills are not inborn, especially among

You may be saying that you ave tried these things and they ever really work, chiefly because it is so hard for volunteers

sent; encourage a cultural sele that sharing of re-ces is valued and appreciat-

tors and tutors must under learning styles. Finally, it is always good to show recognition to yo

that with some appropriate training, many technical professionals can make fine teachers. their experienced people an op-portunity to stretch and develop professionally. Full-time technitrainers can create such opp cians have an opportunity to net-work with other professionals with whom they might not oth-erwise come in contact, and vol-unteers return to their jobs with

In addition, stone neutroctors will need to learn be design and develop course mrisls. And all instructors me

Redkey is a data por at UNUM Life Insu Maine, and author of The Technical In-structors Randbook — From Technic to

COMPUTERWORLD's

October Training Editorial Topics

- CASE: Preparing users Executive Report: Show Distribution: TCP/IP Conference Ad Close: Sept. 26
- old you use part-time inst 9 Special Report: MIS in the 1990s
- Ad Clour: Oct 3 Do's & don't's of in-house m Product Speelight:
- Pros & cons of 15 training co Executive Report: Security in open times Ad Close: Oct. 17
- Product Spotlight: Unix Market Ad Close: Oct: 24

We Cover All the Bases.

For over 16 years, On-Line Software has provided the finest software training to IBM' users. We offer the most current courses, taught at the latest releases. Classes offered:

■ CICS ■ VSAM

■ DB2 ■ IMS/VS DB (DL/1) ■ SQL ■ VTAM

We also offer training in the use of our products—RAMIS," UFO," InterTest; and VERIFY." All courses are held at locations through-out the U.S. and Canada, and are also available on-site.

For course details, or for more information, call the Education Department toll-free at 800-642-0177. In Canada, call 201-592-0009.

Register by September 29, 1989 and—upon comple-tion of a course—receive a FREE copy of Command Level Programming by William Bruno and Lois Bosland, a \$19.95 value.

Redeem this coupon for your free book. Only original coupon will be accepted.

104 at a squared redemak of learness and harms blacker.

(234-18-99)

On Line Software

The Safe Buy

SALES OFFICES

CW BURLEWING /INC

Comparement Managements 27% Comparement State (17), Provingione, MA 5170

Source State Provident, Associates Publisher, Mr Land
Febbook: Source Host Proposition, Planta Office. Manthew State. Control Sold-law SALES Associating (States, Copyr), News, Classified And Andrewsking (States, Copyr), News, Classified Andrewsking (States, Artic Copyr).

SUCCESS: the Product Success Development, American Street, Manager, Manufag Communications, May Daylessed Street, State of Communication, Success Street, Street, Principles Street, S

FOREIGN EDITORIAL/SALES OFFICES

The state of the s

Ger in 1 years and the second of the second

Communications for the communication of the communi

ADVERTISERS INDEX

Amdek Computers 57 Ameritach 50	JDS Microprocessing
Andersen Consulting 24	Maria Academia
AT&T70-71, 88, C3	Kelly Services
Ald1	Knowledgeware
BMC Software	Lawson Associates
Bull Worldwide Info Systems . 62-63	Legant Corp
DOS HOLDINGS HIS SYSTEMS . OZ-GO	
Cehners Exposition Group 100	Mansfield Software Group
Cambex Corp12	McCormack & Dodge
Candle Corp	Memorex/Telex
Chinon America46	Micro Focus
Codex	Mitek Systems
Cooex 52-53	milan systems in initial initial in initial initial in initial init
Communication Networks '90 68	
Compuserve Data Technologies 31	Network Systems Corp
Computer Associates 3, 16, 79	
CW Circulation 55	On-Line Software Int'l
CW Editorial Reprints	Oracle Corp
CW Recruitment 67	Oracle Corp
	Pecific Data Products
Datapoint 58-59	Plot Executive Software
DCA36-37	Pletinum Technology
DOT	Poreion
	rotelon
Eastman Kodak 54	
Eshtman Kodak Copy Products 78	Santa Cruz Operation
Evolving Technologies Corp 48	SAS Institute
Eroring tonesander surplimin to	Software 2000
	Software Engineering of America
Fulltsu Business Comm Systems 69	Software Spectrum
	Sour Products
	Sybase inc
Hayes Microcomputing 93	Syncsort
Hewlett-Peckard42-43	Synoptics
	Synopucs
IBM18-19, 40, 66, 99	TBS Software
IDC Financial Services	Televideo
Inference Corp 91	3M Corp
Information Dimensions 84-85	34 Corp
Informer Computer Terminals.	
Inc	Unisvs
Infotel	Universal Data Systems
mrocer	U.S. Japan Alliance
Innovation Data Processing 7	U.S. Sprint
Integral	V-2
Interface Group 60	
Interface Systems	Zenith Data Systems

65

The index is provided to be additional service. The publisher date not assume any highlighte service or comm

Have A Problem With Your Subscription?
We want to ourse it to your complex estimation, and we want to do it Prisses write to.
COMPUTERWORLD, P.O. Box 2843, Marico, Olio 4303-53043.
Your magazine subscription label is a valuable ounce of sinformation for you and us. You can

Address Changes or Other Changes to Your Subscription
All address changes, etc. should be accompanied by your address label, if possible, or by a copy of the information which appears on the label, including the coded line. Please

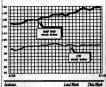
Your New Address Goes Here

Address shows: D Home D Business
Other Questions and Problems
It is better to write us concerning w

d to reach us quickly the following toll 1-800-669-1002

COMPUTERWORLD
P.O. Box 2043, Marion, Onio 43305

STOCK TRADING INDEX



Indexes	Last Week	This His
Communications	127.4	127.
Computer Systems	89.7	91.
Software & DP Services .	114.2	115.
Semiconductors	54.7	56.
Peripherals & Subsystems	81.3	80.
Leasing Companies	123.9	123.
Composite Index	90.8	91.
S&P 500 Index	148.6	147.
Communications		











Computerworld Stock Trading Summary













Disk crash

Merrill Lynch in net experiment

BY ELISABETH HORWITT

NEW YORK — The payback for becoming the first customer of network management, services spirity provided by IBM and MCI Communications Corp. in "Year" upgrade to the hind of intelligent, integrated multivector system that most 15 management of the payback of the most payback of the payback o

telecommunications.
The risk for Merrill Lynch is The risk for Merrill Lynch is at it is entrusting its corpor-ewide network to IBM and Cl when "they are just getting to the business," Peters aid. "So it's a judgment call bether they can deliver what ey promise." A five-year contract, which

A tree-year contract, which the parties expect to sign next month, calls for MCI and IBM to develop a tailored system that will centrally manage Merrill Lynch's network from IBM's network control center in Raleigh, N.C.

The investment firm will transfer 45 to 50 employees transfer 45 to 50 employees from its current network man-agement staff to MCI and IBM payrolls, retaining 20 staffers for the internal center, Peterson

One of the biggest selling points of MCI and IBM's offer

the costly job of revamping and integrating Merrill Lynch's exintegrating Merrill Lynch's ex-inting network management sys-tem, "which we thought would be impossible for us to do by our-selves," Peterson explained. The contract's \$50 million price tag is about what Merrill Lynch would have had to pay to

operate its existing system over the same period without any ma-jor upgrade, Peterson said. Lack of experience managing

other companies' networks, cou-pled with an eagerness to gain a major customer, probably made IBM and MCI more willing to tai-ior their solutions to Merria Lynch's needs, Peterson said. In contrast, General Motors

Corp. subsidiary Electronic Data Systems Corp., another conrstems Corp., another con-moder for the contract, insisted that Merrill "fit more into the EDS mold [of a] more generalized ap-proach they already had," he added.

The agreement rep of a project, begun last year, to re-evaluate the vestment firm's telecommuni-

cations network. The project re-sulted last June in a five-year, \$150 million contract for MCI to become the sole provider of Merrill Lynch's telecommunica-tions services (CW, June 12). The system will monitor

troubleshoot and perform capac-ity planning for the investment firm's entire telecommunica-tions network, both in the U.S. Extras

IBM and MCI will incorporate several unannounced feature into Merrill Lynch's network management system. The fea-tures, which may become commercial products, include the fol-

lowing:

a Expert systems designed to quickly pinpoint problems and invoke prearranged action, such as rerouting of transmissions to backup lines, to get the system up and running again while the

problem infined.

- More direct, real-time access to traffic and error information concerning the MCI circuits that early Merrill Lyes's traffic.

- New lines or capitally and the phility will concern the concerning the MCI restens.

- Integration of a variety of worker's products into Nextices, through an IBM RT, which will concernite transmission from surious devices. Size out irrelevant information, transmission devices. Size out irrelevant information, transmission devices. Size out irrelevant information, transmission devices are considered to the control of activate dependent of the control of

It will also provide a "manager of managers" — based on IBM's Netview — for coordinat-

Merriii Lynch.
Currently, each subsystemmanages a different vendor's network offering, such as Racal hiligo modems, Network Equipment Technologies, Inc. T. awitches and MCIT1 services. ing diagnostics, monitoring, troubleshooting and data collec-

CA casts some light on Cullinet database plans

BY ROBERT MORAN

nounced the strategic direction of the IDMS database it officially acquired with Cullinet Software, Inc. last week and CA-Data-

c. but week and CA-Duta-miDB, an entire requisition. In brief, the company said it ams to continues integrating its so ducts under its Applications anternation Environment. To tat end, CA said it will add CA stended SQL to IDMS, now worm an CA-IDMS/DB. As positive proof that it could tend the Bagabio Calinet-show that the could be and the country of the country of the country of the country of the with the old IDMS, CA.

with the old IDMS, CA re-red to its work on CA-Data-n/DB, which it gained with acquisition of Applied Data search, Inc. last year. That duct has been retooled with

product has been retooled with supects of its CA-Holverse rela-tional detahase and SQL. Curtis Corder, coordinator of operations systems and data ad-ministration on Northwest Natu-ral Gos in Portland, Ore., said the company has been beta-leading CA-Datacom/DB Release 8.0 since luly and that the new ver-sion exploits IBM's Enterprise Swaters Architecture as well as since play and that the saw wer-sion exploits IBM's Enterprise Systems Architecture as well as referential integrity and SQL. "We have some subjective re-sults as far as response time giv-en by ESA," Corder said. "They

trasting its urgency to address the fate of the Culinet database. njay Kumar, CA vice-presi-nt of strategic planning, said. Cullinet

FROM PAGE 1 ome are let go in the wake of the acquisition.

Top Cullinet officials such as vice-presidents Papows, John Landry and Robert Weller are almost certain to depart. They are among 25 Cullinet employees covered by "golden parachute"

covered by "golden parachute" agreements.

Sanjay Kunsar, CA vice-presient of strategic planning, said Cullinet employees will be informed this week whether they have positions. He would not say how many will lose their jobs of the toll would impact 500 employees from a total of 1,600.

"The Cullinet banking software is still only in beta-testing, and the products are not complete." CA strategic direction calls for introducing CA-IDMS/DB Release 12.0 by the fourth quarter of 1990 with the integration of SQL support.

Jamet Schacht Hall, president
of the Dallas Cullinet User Forum — where CA Chief Executive Officer Charles Wang adppear very promising and hould significantly reduce I/O." Northwest Natural Gas has

Northwest Natural Gas has yet to test referential integrity, but Corder said the SQL extensions have enabled the firm to use SQL syntax to create tables and views and to populate those tables, shillties unavailable with former releases, he said.

CA did not address the overlap with Cullimet in manufacturing and banking software. Condressed 110 attendees the night of the acquisition — said, "The reception was positive, and the users liked what they heard." Schacht Hall said users did not view the announcements as vaporware and that many cited the successful implementation of SQL to CA-Datacom/DB as a

CA will also introduce Re-lease 1.4 of the former Enter-

Late last week, Cultinet sources said some employees were told to no longer report to work and were informed that they would be contacted later for exit interviews. CA said it could

and cumment on those reports.

According to Wang, five of seven top Cullinet sales executivos will remain with CA. He added that the Cullinet service and support structure will re-main intact but that there will be reductions in numbers in areas of

reductions in numbers in areas of "reductancies."

Several Collinet workers ex-pressed optimism shout their prospects last week, banking on the value of the installed customer properties. CA is "inheriting 2000 IDMS customers," said a Cul-linet software engineer. "If they get rid of us, they're dead."

prise:DB for DEC VAX/VMS systems. Kumar said the rela-beled CA-DB/VAX now recog-

Systems, 1889, 188 Computer. In contrast, CA-HDMS/DB will be positioned for high-end IBM mainframes and the VAX platforms.

nesn it," see accor.

Other employees expressed
one reseatment toward mangement because it failed to turn
he tide. "We all thought Cullinet
rould make it back. I feel we got

would make it back. Heet we got sold out, and I don't know by whom or how," one member of Cullinet's customer support staff said. "You're talking one group of severely beat-up people," a developer said.

Not so, Kumar said. "The products can perform side by side," he said. "There are differ-

products can perform sake by second, but eventually there might not be differences in who sees what to what." president of Digital Comutities, line in Agoin-ter, Mass., said: AC one owns source code for three different source code for three different products and dispirate, such said and dispirate such based to the products and dispirate such based to four years of develop-ment lime to badd a more inte-mad. "If they can buy that time, said." If they can buy that time, we will be a principal composithey will be a principal competi-tor to IBM — a choice that will help the industry."

"This probably holds the best hope for the enhancement of IDMSR," another said. Nevertheless, last week's action was depressing for many, "it's dewastating it's very said to see the name go sway," said a support saff member. "We want CA to resine that Collinet people have a lot of pride. They say they like that, We'll see if they really mean it," she added.

Other enablements Cullinane said he plans to sarn to speak French and play the pizno, as well an start a comthe piano, as well an start a com-pany to look into promising new technologies. "Forcing oneself to learn something new and dif-ferent is good for one's spirit and health," Cullinane said. Cullin-ane's CA stake is estimated at

While acknowledging the damage done to Cullinet by IBM's DB2, badly timed manextravagance, the great problem was the shrinking of lem was the shrinking of the drame software market ed by the personal computer action, Callinane said: "The drame software business ame software business ntastic for 15 years. Cul-

Bush tech policy lacks money

BY MITCH BETTS

WASHINGTON, D.C. - The WASHINGTON, D.C. — The Bush administration officially re-leased its high-tech policy last week — calling for intensive re-search on high-performance su-percomputers, software and a national information network —

but made on promises that there will be money to pay for it all. The ambitious five-year re-search and development prosearch and development pro-gram has a price tag of \$1.9 bil-ion. In essence, it will create a

report, released by the White House Of-fice of Science and also provides a politi-cal boost for a bill sponsored by U.S. Sen. Albert Gore Ir.

A major compo-nent of the program

The Pederal High-Performance Computing Program is needed to boost U.S. competi-tiveness in civilian and defense technologies, as well as solve some of the nation's greatest re-search challenges, the inter-agency report said. For example,

tor prices and dumping them into the U.S. market. But this does not faze the Jap-anese, who have pressed on with their efforts. Although U.S. ven-dors have taken large bites of the Japanese market in every area

m PCs to minicomputers, the sunese have chosen to take it supercomputers. Why? In

Typhoon FROM PAGE 1

vernment is biting off its nose spite the nation's face.

to spite the nation's face.

"There's no question that the end user suffers whenever you have official limitations on free trade," said Osari Serlin, president of Los Altos, Calif-based Itom International, Inc. "It's become a very emotional issue where matters of belief have oc-

In many ways, the supercom-puter industry has become the rallying point for the frustration that has evolved through Ameri-ca's trade slippage. Like the space program, supercomputers have become a matter of national pride so intense that some be-lieve that unless the U.S. is far

rgo are not afraid to ting at tify their cause, John Rollwagen, chief executive officer at Cray Research, pleaded before the Senate Subcommittee on Sci-ence, Space and Technology that the U.S.' lead must be mained because supercomputers "the only truly offensive

With some configurations costing more than \$20 million, the sale of a supercomputer can make an awfully big splash — or a terrible punch in the stomach.

"If we were talking about Toyoter I don't high in the stomach."

a big deal," said John Sell, presi-dent of the Minnesota Supercomputer Center.

Some charge that a thinly-

computer Center.
Some charge that a thinlyvilled jingoism obscures what
are essentially technological issues. "Supercomputers are only
tools, and the important thing ishow we use these tools," said
Gary Senshy, an analyst at the
New York-based Needman &
Co. research firm. "It's the carpester we should worry about,
not the harmon the harmon the harmon the

However, the Bush administra-tion is clearly worried. On June the Japanese government was cited under the 1988 Omnibus Trade Act for unfair supercom-ETA systems are installed in Ja ETA systems are installed in ja-pan and only one Japanese super-computer resides on U.S. shores. If the "unfair" tactics on on corrected, U.S. Trade Representative Carla Hills warned, then retaliatory tariffs

could result.

The tactic has left some vendors smarting, "We're not twoheaded monsters: we're tookcally competent, professional
people who d'just like a chance to
compete on a level playing field,"
said Samuel Adams, a vice-producet
at RNSX Super-computers,
the, a joint venture of NEC and
Honeywell, Inc. in Burlington,
Mans.

Mass.

However, with some analysts
predicting that market leader
Cray may be fighting for its lead
within two years, U.S. officials
are determined not to let the

U.S. edge slip away. A bitter taste still lingers in the mouth's of those who saw the evapora-tion of U.S. dominance in the consumer electronics and semi-

consumer electronics and semi-conductor markets.

Last week, the President's
Office of Science and Technol-ogy Policy proposed a \$1.9 bil-lion plan in which the U.S. would

Economies of scale

ile still growing, the supe to seriormance systems Minisupercomputers2.360 6 340 2,145 23,300

· Other high-performance systems 9,900 12 500 · General-purpose workstations..... 162.600 315,000

almost double its spending on advanced computing research technologies (see story above), resulting in the development, resulting in the development of supercomputers that may be up to 1,000 times faster than to-day's most powerful computers. While Japans in not the only recipient of close screttiny — the Boush administration is also supply divided over whether to

accused of trying to secure a toe hold in the U.S. market by drae

mally the case in the U.S.

The impetus for the challenge
was provided in 1981, when japan amounced its Pith-Generation Computer Project. The goal
was to completely supplied the
existing state-of-the-art supercomputers by 1991, and ambitious research and development
programs were lumched by
NEC, Pujtton and Risachi.

Eight wears later, latenal's ef
Eight wears later, latenal's ef-

(EC. Poitto and Hisachi. Eight years later, Japan's efforts are paying off. Part of its ggreasive game plan stems your is awe of a towering corporate giant on its abores — 189M pan. "IBM Japan dominated comparing in that country for earn, and they fid it in a way lat Japanese vendors can uncreasan does by measuring years attention to contoners." percomputing Review."
apas was the model, goal

officials intend to put up a fight. The federal government has played a key role in the developw, the U.S. in trying to d

Committee of printing field of a first installation and the control of the committee of the

POSTRASTER: Send Form 3579 (Change of Address) to Computerworld, P.O. Box 2044. Marion, OR 45305







TRENDS



ow many working days it take to fill your last



41 m Premolece Los Angeles 52 How many working days did it take to fill your last vacant entry-level position? 28 Dellas

> Los Angeles 31 31 New York 32 Chicago 32 San Prancisco Washington, D.C.

122

NEXT WEEK

C adbury Schweppes, Inc. ClO Joe Nash has put into practice an innovative approach to the IS/ user relationship. To iden-tify users' automation needs at firms acquired by Cadbury, IS staffers spend weeks studying the business operation on-site, for-bidden to talk technology until the review is complete. A report appears in Manager's Journal.



S trategies have shifted and price scrimmages have inflicted some heavy casualties at the end of the hardware spectrum that encompasses PCs, work-stations and small systems. The second half of Computerworld's annual Hardware Roundup provides rundowns of the year's wins and losses in each league, along with rosters of active players.

INSIDE LINES

Change partners!

Courtrom ensembs apple and Microsoft could abook the computer community this week with an agreement to swap of tweet to swap of tweet to the computer community this week with an agreement to swap of tweet to change for controlling injustment and typedices, ources often to the computing any, Apple has begun to swerr Adobe and amounted this interfit to create or lorses a close of Adobe 's appoint Postacript program. Microsoft recently obtained such PIUL technology when its presented Soil jose, Calibration Soil Policy. Calibration Soil Policy Soil P

One foot on the runway Con's dools of Goom Systems Netwaster over IBM's Netwice could well be an interior decision, according to the artice nubularity assets/approached ONAT Teffun. Indeed, Coris is "sorting with BIM on a funce Netwice" that does, Coris is "sorting with BIM on a funce Netwice" that does, Coris is "sorting with BIM on a funce Netwice" that the contract of the Coris is "sorting with BIM on a funce Netwice that the contract of the Coris is the Coris is the Coris in th One foot on the runway

Memory of an elephant

Memory of an elephant Microsoft seems to be of two minds on user complaints about OS/2's appetite for memory. Microsoft product menager: Cam-room Myrroid uspit salt on the one hand, users are willing to pay for things that run hardware faster: "Look at the success people have had with Intel® 1803-Beased hardware." Then again, be admits that a drop in memory prices is "very impor-tant to marke OS/2 more affordable to move to."

Not any cheaper by the dozen

Not any cheaper by the dozen.
ATÉ may be harje second thoughts about giving users such great deals on individual lines under its Accume Spectrus of Digital Services att. A 64th White-Cordu costs less that one-fourth of a comparable Dissuphone Digital Service (DIOS) line:— a great class. But the whole point of Spectrum is exposed to be fractional T1, which makes it cheaper for custom error to by lines in bandles. Boying a domest. Spectrum circuit costs only about 10% less than buying them individually—no much of an intendrit

The name game
The long switted BM repository will be called "The Repository No" in the rich state of the called "The Repository No" in the rich in carcording to a source close to the associatement. But had do to your hast. There are reports that names have been changed wered them in the pair for weeks and that the half for the whole strategy, AD/C, cl., only cropped up for their times a month age. Stys an BM official to one CASS week!" "This is the most disclosed BM associatement since the AS(400)."

DEC Repos-itioning

DEC is planning its own CASE offensive following IBM's re-pository extravagants this week. Word is that the official date for a DEC CASE amouncement is Oct. 3. A new version of the RDB DBMS and enhancements to the CDD Plus data dic-tionary will be among the CASE offerings.

Seeing is believing
IBM has achieved relating of 60 to 100 MIPS on a single RISC
IBM has achieved relating its has 60 to 100 MIPS on a single RISC
IBM has achieved relating its has 60 to 100 per control of the contro

As Richard Miller sweeps through the halls of Wang, put-ting his viron first to the gasts of landhadaistical managers, one comment from a Wang employee uses judged nathed enough to bring to our attention." I don't know if I like working for a singe. "I you sego brighter news, bring it to the electrical of News Editor Pats Bartalik at 800-343-6474 or 508-679-67700. Hey, he I ledu the bad many.

Now the best Business Virtual Private Network money can buy costs you less.

If you select AIRT SDN (Software Defined Network) Servicebefore October 15, performance and reliability won't be the only benefits you'll get. AIRT is waiving substantial charges for its new and existing SDN customers. So our service becomes an even better value.

If you act now, you'll not only save money, you'll be getting the enduring benefits of the SDN service with more advanced features than anyone in the industry.

Only ATRT has a dedicated SDN control center with specific technicians who can help you monitor and provision your SDN Our service is so efficient, you'll think your company has its own private network. Yet, you'll only be charged for the actual time and distance of your calls.

Another of the many advantages to AT&T SDN is flexible routing. If you can't get through on one number, you have the ability to put your call through on an alternate number. With our Network Management capability, you can even change the number from your site in near-real time. Or, you can personally select an announcement to cover your needs in a crisis situation.

ATRI is also the only long distance company that offers full data base redundancy in dual locations. No other carrier can give you that security. And our SDN has more points of presence in the U.S. We also route to more international locations than any other worldo. This means your company gets virtually uninterrupted service worldowlife.

Call your Account Executive to sign up for ATAT SDN Service now. This promotion only lasts to October 15. Never has the best SDN money can buy cost so little.

Promotion lasts until October 15, 1989.



There's only one software company that can lead you into the next millennium.

To meet the challenges that await you in the next age of computing, it only makes sense to follow an experienced guide = A company with a proven track record of success, leadership and technological achievement =

McCormack & Dodge is just that company = We can point to a 20-year history of leadership in Human Resource and Financial software = A history marked by accomplishments like the first truly integrated processing environment – Millennium® = The first DB2 systems development tool from an applications software vendor = And now, the first true SAA workstation =

Call 1-800-343-0325 and ask for our white paper which describes in detail how McCormack & Dodge is dealing with your concerns about SAA = You'll find out why our 20 years of success is just what you need to face the next 20 years of change =

20 YEARS OF SUCCESS IN FINANCIAL AND HUMAN RESOURCE SOFTWARE

McCormack & Dodge

